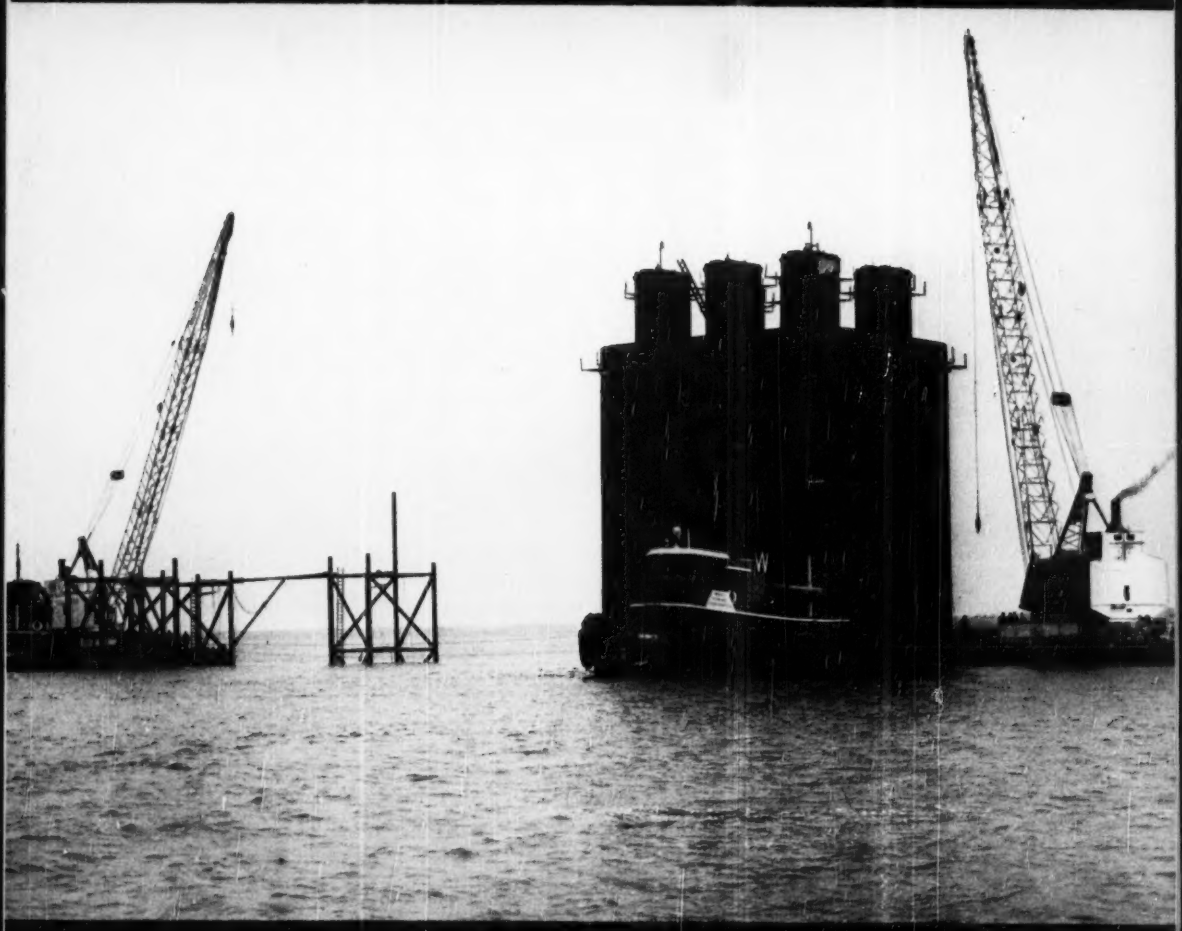
ENGINEERING NEWS-RECORD



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PIONEER AIR LINES HANGAR
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MARTIN-JOHNSON ENGINEERING CO.
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uses BYERS WROUGHT IRON PIPE

In this new hangar, with more than three-quarters of an acre of floor area, a high vaulted ceiling, and large, frequently-opened access doors, the job of maintaining proper temperatures for both personnel and planes presented a difficult heating problem. The designers solved it with radiant heating. And to safeguard the heating system against excessive maintenance and premature replacement, they specified wrought iron pipe.

More than 20 tons of Byers Wrought Iron pipe was embedded in the concrete floor. Hot water, circulating through the pipes, heats the concrete which radiates ample warmth through the hangar. A portion of the installation is shown above.

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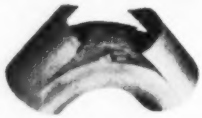

WHY WROUGHT IRON LASTS

This notch-fracture test specimen illustrates the unusual fibrous structure of wrought iron—which is responsible for the unusual corrosion resistance of the material. Tiny threads of glass-like silicate slag, distributed through the body of high-purity iron, halt and disperse corrosive attack, and discourage pitting and penetration. They also anchor the initial protective scale, which shields the underlying metal.

BYERS

CORROSION COSTS YOU MORE THAN WROUGHT IRON

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A
B
C
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A
B
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ENGINEERING NEWS-RECORD

ABP Member ABC

Volume 145 DECEMBER 21, 1950 No. 25

WALDO G. BOWMAN
Editor

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CONTENTS:

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YOUR TYPE of construction equipment—engines included—is plainly, soundly covered in this book. You'll be able to judge for yourself which types of lubricant best suit various machines and conditions. You can make your own point-by-point check-up on the complete line of Cities Service lubricants—engineered in types and grades sure to be more than a match for fierce loads, weather and terrain. The performance records prove how sharply maintenance costs go down... how steadily grueling schedules are met... with Cities Service lubricants on the job. Call the nearest Cities Service office for competent aid, or write us direct.

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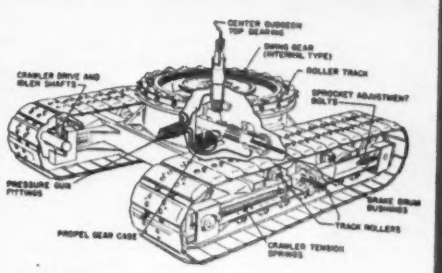
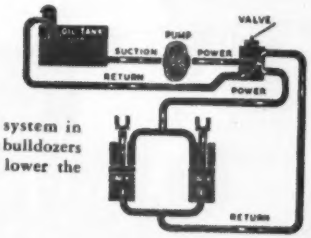


"FIG. 23

Shows internal type open gears of swing rack and one method of lubricating trunion and other shaft bearings... The 'propel' gears are enclosed and oil lubricated. The crawler track and other parts lubricated through pressure gun fittings require grease. See lubrication chart for proper type and grade..."



"FIG. 33

Hydraulic system in use on some bulldozers to raise or lower the blade."

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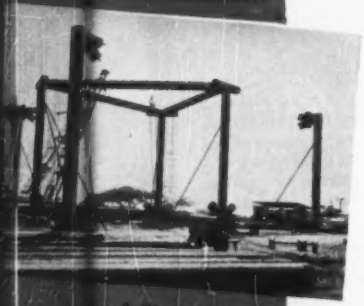
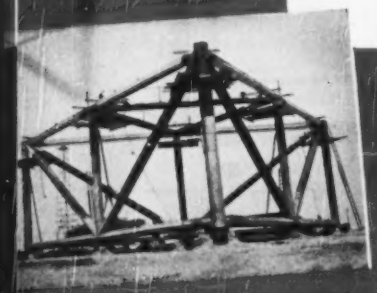
Construction of pipe frame 36ft. sq. 30' high, 30' long on each side of the triangle.



2. Closer view of the starting framework, showing 22" diameter steel pipe being used.

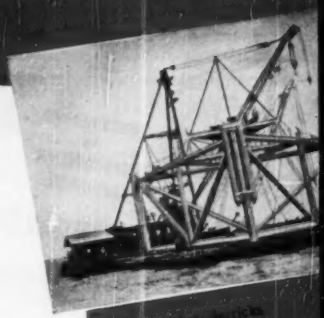


3. Completed framework, welded and watertight except for the corner verticals, which will accommodate anchor spuds.

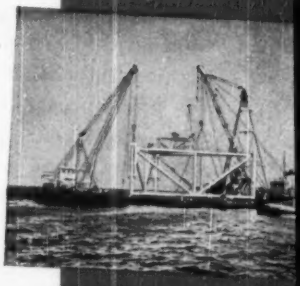
The Problem: 250-foot Gow soil borings, accurately spotted five to ten miles offshore in the deep waters of Lake Maracaibo, Venezuela. The Project: pile foundations for future oil-well derricks. Special Hazard: 70-mile-an-hour "chubascos," violent squalls that would wreck temporary platforms.

The Solution: Raymond engineers designed a triangular *floating* platform of 22" steel pipe, welded and watertight. The three corner members were left open for 120-foot-long anchor spuds. Assembled on shore from steelwork fabricated in New York, the 60-ton float was skidded onto two barges and towed 32 miles to the first boring location where floating derricks launched it. Spuds and deck equipment were placed later, including winch-controlled anchors at each corner to help in spotting the float and holding it steady during boring operations.

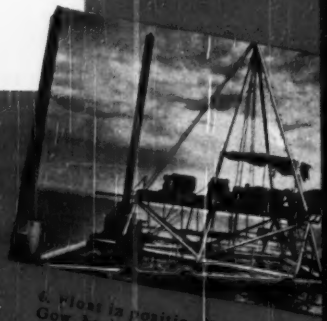
The Moral: When the problem is tough, the answer must still be *right*. That's when it pays to have a resourceful, experienced organization on the job . . . like Raymond!



4. Floating derricks preparing to lift the float from barges and place it in the water.



5. Launching the 60-ton float. Note work platform erected 10 feet above framework.



6. Float in position for Gow boring operations, anchored by the 120' spuds and cables at each corner.

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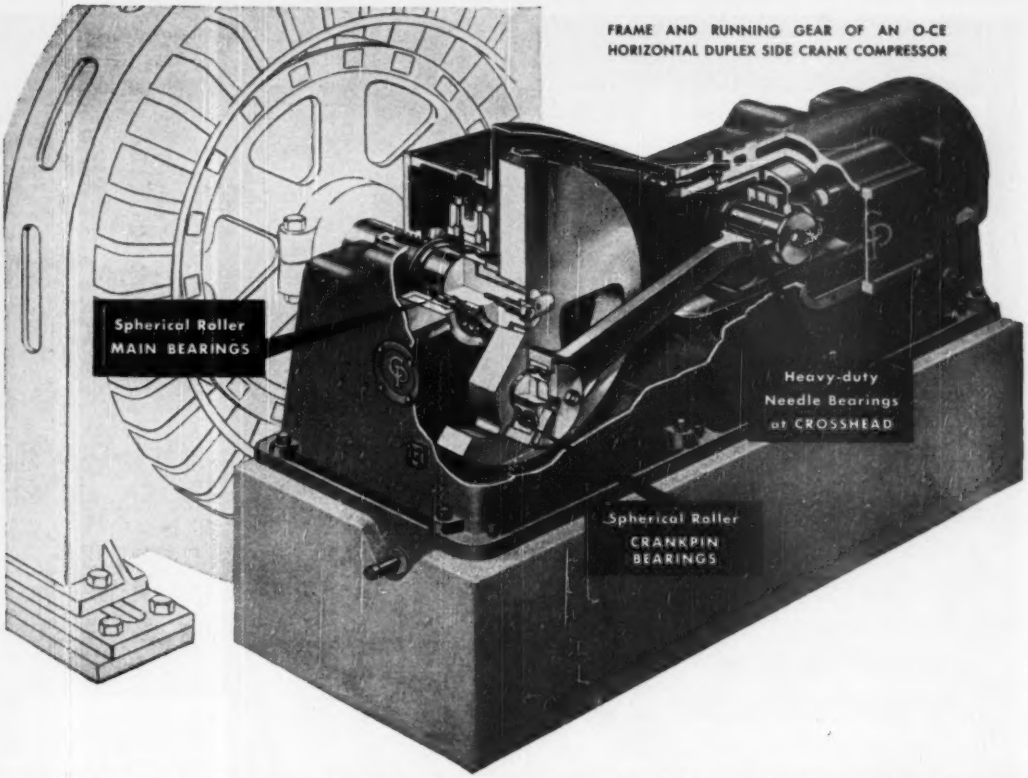

FRAME AND RUNNING GEAR OF AN O-CE HORIZONTAL DUPLEX SIDE CRANK COMPRESSOR

FIRST WITH ROLLER BEARINGS THROUGHOUT

IN A HORIZONTAL DUPLEX COMPRESSOR

- SPHERICAL ROLLER MAIN BEARINGS
- SPHERICAL ROLLER CRANKPIN BEARINGS
- HEAVY-DUTY NEEDLE BEARINGS AT CROSSHEAD

Chicago Pneumatic's Class O-CE AIR COMPRESSORS are the first horizontal duplex, side crank compressors to have anti-friction roller bearings throughout . . . spherical roller main and crankpin bearings . . . heavy-duty needle bearings at the crosshead pins.

To the user, "roller bearings throughout" means easier and cheaper maintenance, and no possibility of improper bearing adjustment with resultant serious damage to frame and running gear.

Roller crankpin bearings permit the use of solid-end connecting rods—the strongest, safest type.

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Class O-CE Motor-driven Compressors are furnished in sizes up to 2000 h.p.

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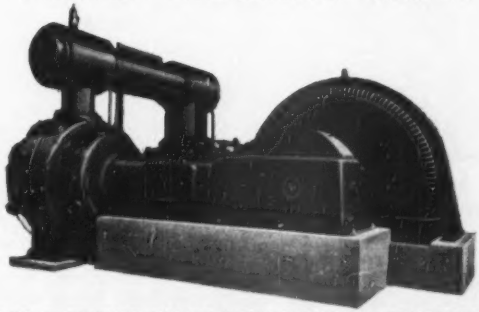

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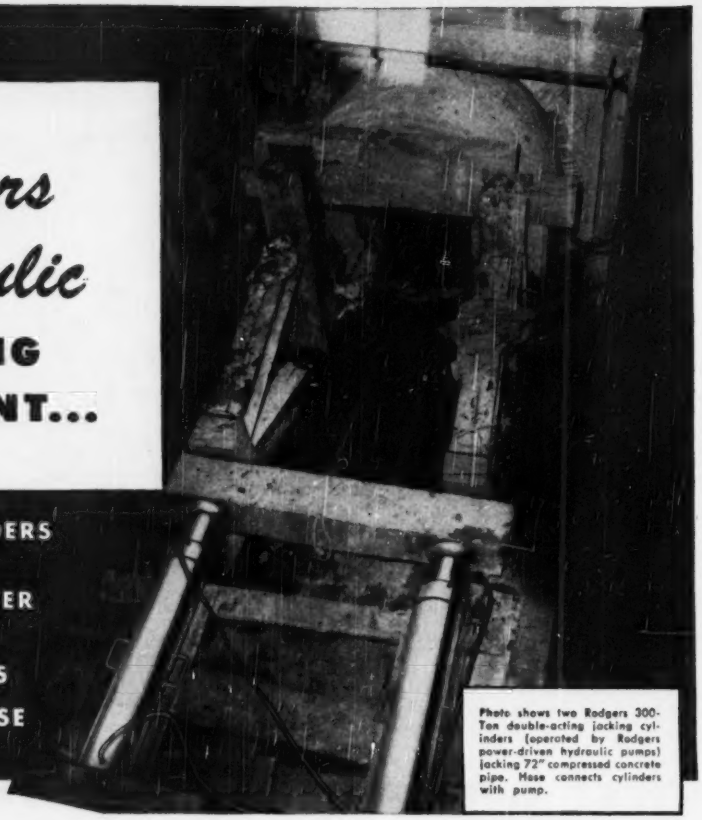

Photo shows two Rodgers 300-Ton double-acting jacking cylinders (operated by Rodgers power-driven hydraulic pumps) jacking 72" compressed concrete pipe. Hose connects cylinders with pump.

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To learn advantages of Rodgers Jacking Cylinders on construction jobs . . . get the new Rodgers Catalog No. 317. It gives full information.

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Complete specifications, illustrations and suggested uses are included in the new Rodgers Jacking Equipment Catalog.

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HYDRAULIC POWER EQUIPMENT

How TIMKEN® bearings help P & H shovel really dig in

THE Timken® bearings throughout this P&H 955-A Excavator guard against troublesome and costly delays for maintenance—really keeps it digging in.

With jackshaft, hoist drum, digging drum, boom hoist drum, intermediate hoist shaft and intermediate swing shaft all mounted on Timken bearings, shock loads are absorbed with ease. Shafts are held in rigid alignment. Gears mesh with precision.

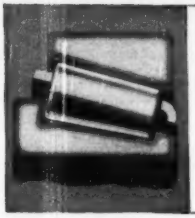
Because of their true rolling motion and incredibly smooth surface finish, Timken bearings operate freely, frictionlessly under the heaviest loads. Tapered design enables them to carry any combination of radial and thrust loads. Maximum load-carrying capacity is provided by line contact between rollers and races. And tight, lubricant-retaining closures may be used to keep out damaging dirt and moisture.

Made of Timken fine alloy steel —the best steel ever developed for tapered roller bearings—Timken bearings normally last the life of the machine. They are engineered for the job and are precision manufactured.

No other bearing can give you *all* the advantages of Timken bearings, backed by 50 years of bearing research and development. Whether you build or buy equipment, it will pay you to insist on Timken bearings. Always look for the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

How the HARNISCHFEGER CORPORATION mounts the hoist drum shaft of its P&H 955-A shovel on Timken bearings to insure extra load-carrying capacity, longer life.
P&H



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Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer.

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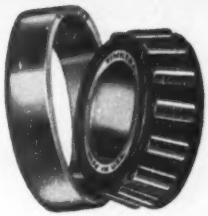

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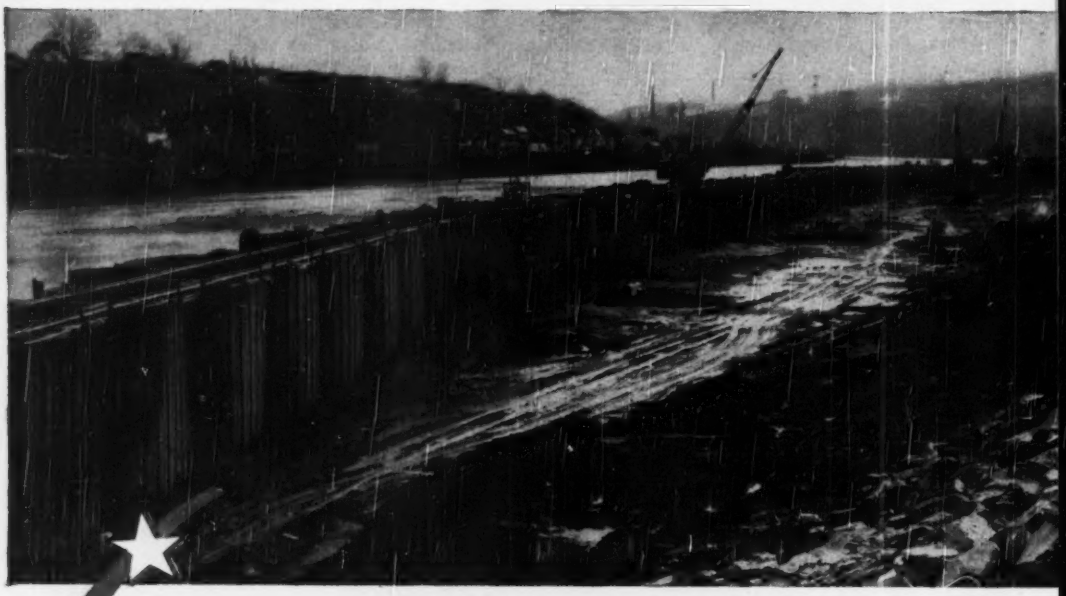


Other Pertinent Facts

This project will increase present channel depth of 7 ft. above Morgantown to 9 ft. The new lock and dam is designed for eventual pool depth of 12 ft.

★

This important navigational improvement will permit boats now carrying about two-third capacity to carry full capacity.

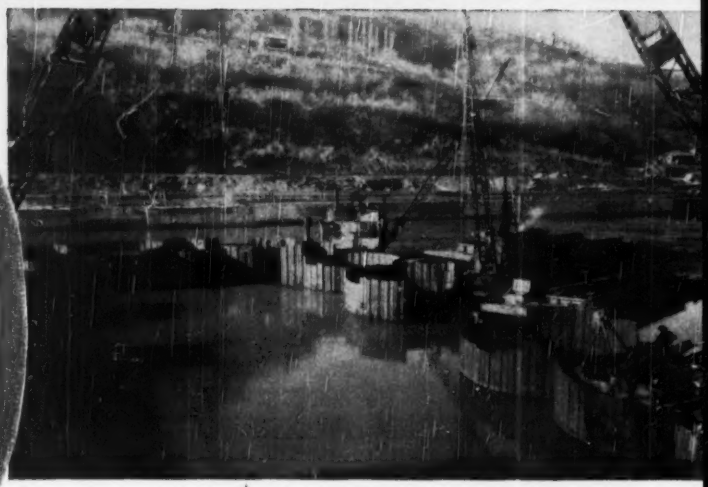
★

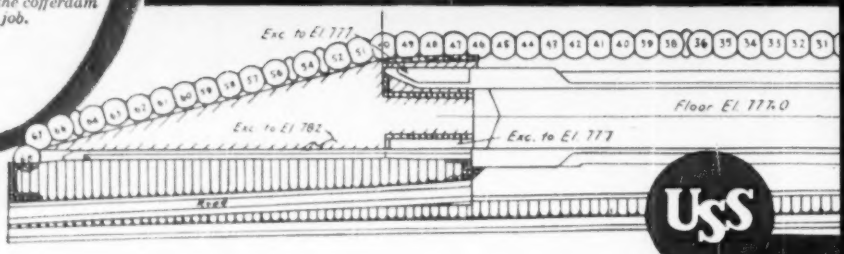
Because the new Morgantown lock is nearly twice as long and almost 50 percent wider than before, bigger tows carrying heavier loads can be accommodated.

★

A total of 2,200 tons of Steel Sheet Piling were used in the cofferdam construction on this job.

★





USS

speed up construction of new Morgantown Lock and Dam

112 connected cells form the cofferdams that expedite $6,343,650 Monongahela River channel-deepening project.

NOW being pushed to completion well ahead of schedule, the new Morgantown lock and dam offers another interesting example of what you can gain by using a combination of sound engineering, competent construction methods, and the right materials for the job.

Constructed by the Contracting Division of the Dravo Corporation for the Corps of Engineers to replace two small, outmoded locks and dams, the new 18-foot-lift tainter gate dam and the 600-foot lock are part of the improvement plan for the busy Monongahela River.

Built in three major stages, the project involved the construction of an extensive system of steel sheet piling cofferdams. The first stage was the construction of a cofferdam of 67 connected cells for the lock and guide walls; the second stage included the construction of a cofferdam of 26 connected cells enclosing the east half of the dam; stage three consists of the construction of a cofferdam of 19 connected cells enclosing the remainder of the dam. Each cell is approximately 35 feet in diameter, and the steel sheet piling, approximately 35 feet in length.

Some idea of the construction speed maintained on this vast project is indicated by the fact that the 67-cell cofferdam for the lock was begun in November 1948 and completed around the middle of the following February.

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CELLULAR COFFERDAMS . . . frequently offer solutions to problems of construction on bare rock or concrete aprons where single wall could not be used due to lack of support at the bottom of the piling.

BULKHEAD WALLS . . . for shore protection, flood walls, and to increase the useful area of industrial properties or areas suitable for storage of materials.

SINGLE WALL BRACED COFFERDAMS . . . the oldest and formerly the most important use for steel piling. Arch-Web or Z-Type piling most commonly used.

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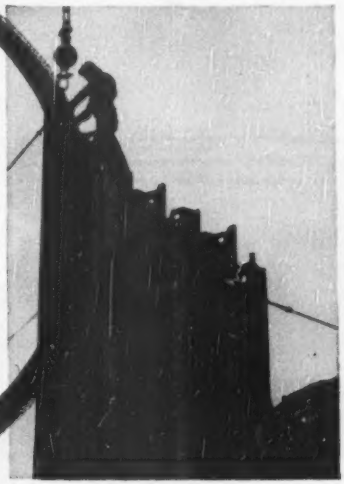
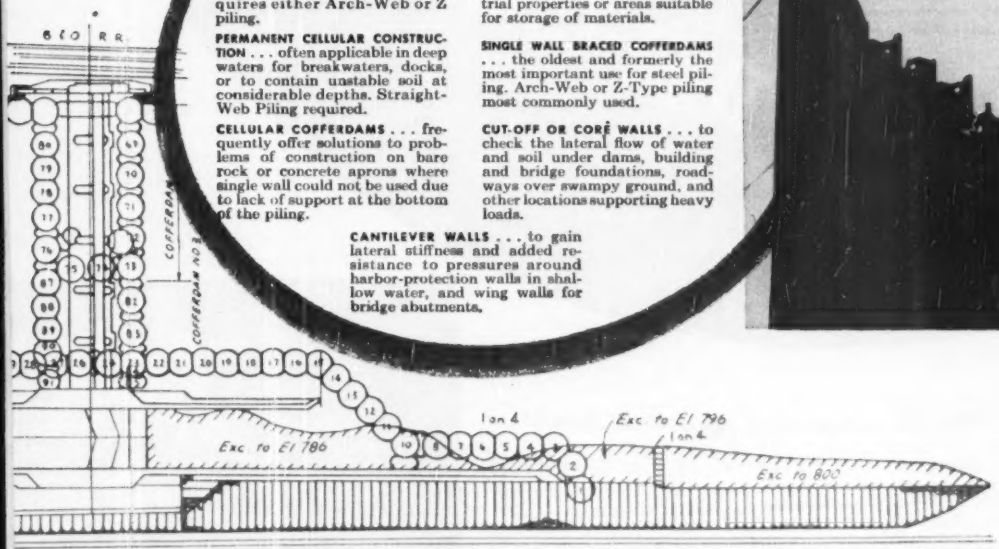
CANTILEVER WALLS . . . to gain lateral stiffness and added resistance to pressures around harbor-protection walls in shallow water, and wing walls for bridge abutments.





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NEWS BRIEFS

Grass or cars?—Board of Supervisors of Lenawee County, Mich., will have to decide which is more important—civic beauty or civic progress—as a result of a deluge of protests over their proposal to convert one side of the courthouse lawn in Adrian into a parking lot. The site would accommodate 40 automobiles. Opponents say the project would mar the beauty of the courthouse square while providing only half the necessary parking space.

Far-North construction—Preliminary work on a power project on the Mayo River in the Yukon is being started this year by the Canadian government. The project is expected to cost about $3,000,000 and take two or three years to complete, producing about 3,000 hp. initially with the amount to be increased to meet added demands. The power will be sold mainly to mines, particularly the Keno Hill mines.

Sub-standard housing study—A house-to-house survey of blighted areas in Youngstown, Ohio, will begin early in 1951, with workers using the appraisal method worked out by the committee on hygiene of housing of the American Public Health Assn. This method is designed to evaluate the health qualities of housing. The survey will be conducted by the Youngstown Metropolitan Housing Authority, with the aid of the Youngstown College sociology students, various women's organizations, and the city health department.

Big pull—An expected long delay in completing the new Seabreeze Bridge at Daytona Beach, Fla., was averted by engineers who succeeded in straightening steel members bent when a barge hit the structure and knocked a leaf of the bascule draw 8 ft out of line. Using a 30-ton pull from a derrick barge anchored to the bank, the engineers quickly brought the structure back into line.

High water hinders construction—Engineers say that the Pine Falls project, the last big development possible on the Winnipeg River northeast of the Manitoba city of that name, is likely to cost $21,750,000 instead of the estimated $20,000,000. The Winnipeg River, which drains Lake of the Woods into Lake Winnipeg started to act up last spring and as late as October was flowing at a rate of 74,000 cu ft a second when it should be at a rate of 20,000. To keep up construction schedules while fending off this tremendous water pressure has been impossible and the job has been set back by four months.

Town vs. gown—A recent civil service examination for junior engineers at Seattle, Wash., has been attacked by empolyes of the city engineering department as giving inadequate weight to practical experience. Many men who have been employed as provisional, or temporary, junior engineers failed to pass the test. Although thoroughly experienced in their special work, they were no match for recent engineering college graduates in the examination, spokesmen told the city council, which has taken the matter under advisement.

Photos for evidence OK—District Judge James B. Linehan in the Bristol, R. I., Court, recently ruled that a State Health Department inspector may take photographs of licensed premises to obtain evidence. The ruling was made in the case of Everett S. Cunard, operator of a shellfish processing plant, who challenged the constitutionality of the practice, and appealed a fine of $25 and costs on a charge of obstructing health inspectors in their work. Cunard's counsel argued that the making of pictures by a state agent would have compelled the defendant "to give evidence against himself."

Cedar Bluff Dam storage starts—Storage of water has begun at the $20,000,000 Cedar Bluff Dam and reservoir near Ellis, Kan. The dam, spanning the Smoky Hill River, is a unit of Missouri River basin development.

To improve Montreal-Quebec road—Route 2, a North Shore highway along the St. Lawrence River between Montreal and Quebec is to be improved by the Dominion government as part of a $60,000,000 road building program. The gasoline tax at 11 cents a gallon for the last fiscal year brought $30,908,312 in revenue and the Motor Vehicle Act brought $14,735,740—a total of $45,644,052 contributed by automotive traffic.

Correction—In our article about timber on page 148 of the Dec. 7 issue a typographical error resulted in the statement that the U. S. Forest Service estimated that there were 1.6 billion board-feet of saw timber standing in the U. S. This should have been 1,600 billion board-feet.

These men are working for you

Astute, efficiency-minded J. A. Henby, Vice President in charge of Production, checks on location of new equipment.

Fred Smith, deliberate, analytical Chief Metallurgist, inspects chemical composition test being run on steel tubing.

Keen-eyed, thorough Fred Brown, Chief Inspector, uses micrometer of special design to check hard-to-reach point.

John Ochs, forceful, energetic Superintendent, Fittings Forging Dept., smiles over another production record.

GOOD SERVICE right down the line is a tradition at Tube Turns, Inc. And with our production management, good service starts with a quality product—one you can always depend on . . .

That's why an officer of Tube Turns, Inc., is in full charge of production . . . why a noted metallurgist heads up a staff of laboratory technicians who make dead certain that only the finest seamless steel tubing goes into production . . . why a man who helped Tube Turns pioneer welding fittings today supervises the forging process . . . why a veteran inspector and more than 30 trained assistants make no less than 15 visual and instrumental inspections of *each fitting* . . .

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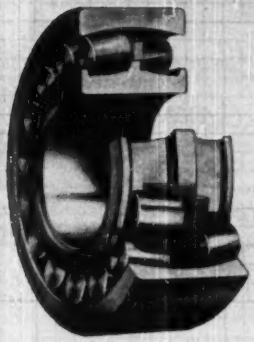

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Screen Equipment Company SECO vibrating screens are built to deliver large tonnage output with minimum maintenance through the use of Torrington Spherical Roller Bearings.

These self-aligning bearings automatically compensate for shaft deflection, require no alignment adjustments in service, and provide the high capacity needed to handle heavy gyratory loads.

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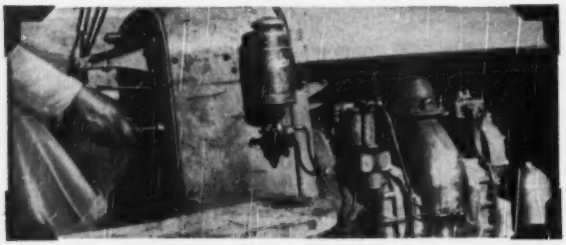
STANDARD ENGINEER'S REPORT

DATA

PRODUCT	Chevron Starting Fluid
UNITS	A. C. diesel engines HD-7 tractors
CONDITIONS	25° below zero weather—parked in open shed
EQUIPMENT	Permanent primer with atomizers on blower
FIRM	John W. Graves Heppner, Oregon

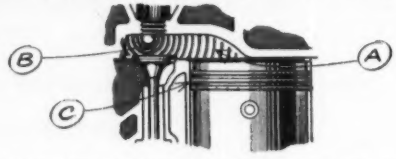
Engine starts on first turn at 25° below zero!



CHEVRON STARTING FLUID started this engine instantly every time during a severe Oregon winter, even when the tractor had been idle for several days in temperatures down to 25° below zero! John W. Graves, owner, says, "Power in the starter battery would last only for two or three revolutions of the engine, but Chevron Starting Fluid required only one turn to kick it off." With one or two strokes of the dash-mounted pump, fluid was forced from the storage tank (left center) into the "blower", before the starter button was pushed.

ATOMIZER NOZZLES, as shown on this diesel "blower", are also used to inject Chevron Starting Fluid into intake manifolds of gasoline engines. Complete primer equipment may be purchased from your fluid supplier. Chevron Starting Fluid comes in 3-pint cans, and capsules of two sizes—7CC's and 17CC's, packed 12 and 24 per can. It is approved by leading engine manufacturers.

How CHEVRON Starting Fluid Starts Gasoline and Diesel Engines Instantly



A. Atomizes in lowest temperatures and provides powerful, easily fired vapor in combustion chamber.

B. Pressure, or the weakest spark, fires mixture—turns engine and heats air for regular fuel mixture.

C. Contains lubricant and additives—prevent cylinder wear and ice formation in primer equipment.

HOT NEWS ON COLD ENGINES

FREE BOOKLET gives you more facts on Chevron Starting Fluid—shows where it should be applied in different type engines. Write or ask for it today.

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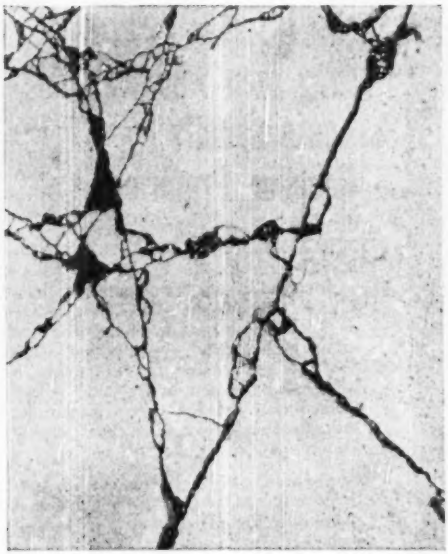

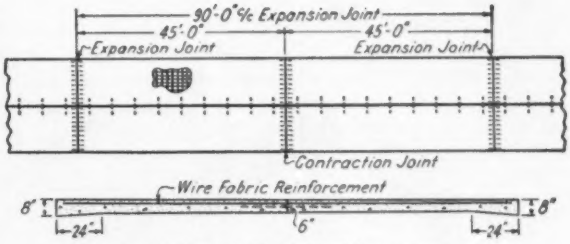

Details of a typical Truscon Welded Wire Fabric reinforced pavement

Structural Action at Cracks in Plain and Reinforced Concrete

As wheel load approaches open crack in plain pavement, loaded slab end carries entire load without assistance from unloaded slab.

As wheel load approaches closed crack in reinforced pavement, aggregate interlock renders the crack-joint shear resistant and both slab ends, instead of one, carry the load.

for preventing pavement breaks

Authoritative records kept by 28 states over the past 25 years give reliable proof that maintenance costs are considerably less for reinforced concrete than for *any* other type of pavement. Truscon Welded Wire Fabric gives these advantages to concrete: Resistance to cracking during setting period • Tensile strength against subgrade friction • Resistance to cracking due to warping • Resistance to development and opening of cracks • Resistance to slab separation • Decrease of spalling and disintegration. Write for illustrated literature giving complete details and specifications on Truscon Welded Wire Fabric.

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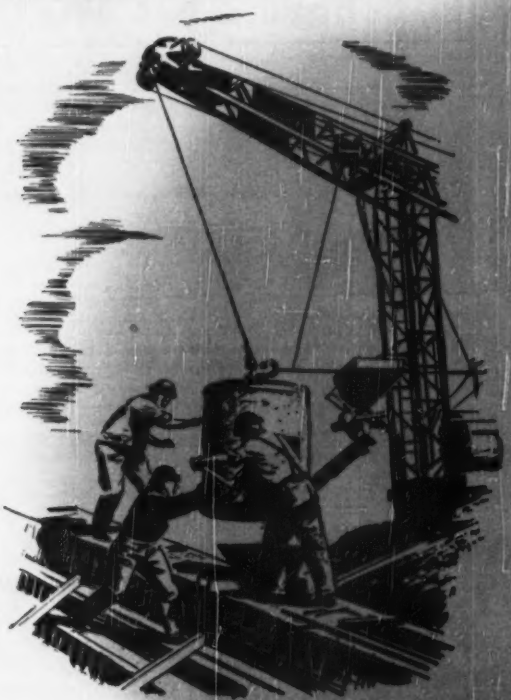

Roebling Preformed Lang Lay "Blue Center" Steel Wire Rope lasts longer; brings fewer shut-downs; cuts down replacement time; saves wire rope dollars.

Why men who watch costs specify Roebling Preformed

THE RECORDS PROVE IT... that Roebling Preformed "Blue Center" Wire Rope stays on the job longer and cuts your costs. This is partly because "Blue Center" steel—developed and made only by Roebling—has unsurpassed resistance to abrasion, shock and fatigue. In large measure, too, it is because of the painstaking care, special techniques and modern precision machines that guard and maintain Roebling quality leadership.

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Today's best buy. Roebling makes wire rope of every construction, grade and size ... engineered for top efficiency on every type and make of rope-rigged equipment. Have your Roebling Field Man recommend the *right* rope for best, low-cost performance on each installation. John A. Roebling's Sons Company, Trenton 2, N. J.

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THE CONSTRUCTION WEEK

CONFUSION IN WASHINGTON IS UNBELIEVABLE—worse than at any time since Korea first surprised President Truman's diplomatic and military chiefs. The single firm decision is that we must arm faster. But beyond that, the Truman men are split wide open. There's no agreement on how far and fast to push arms making and on controls to divert raw materials and fight inflation. Mobilization is being run largely by guess.

STATISTICS CENSORED—Government plans for withholding figures of value to potential enemies will not shut off publication of Commerce Department construction data. Those figures are expected to appear as before, with two exceptions: Only national totals will be shown for military construction, without regional or state sub-totals, and no amounts will be published for atomic energy work.

WATER SAVING—Finding enough water was not a major problem in locating the H-bomb plant. Several sites offered ample quantity; the real problem was quality. The Savannah River location saved as much as $165 million of treatment facilities that would have been required in other areas.

M-4 TEST—Home town boys tested the determination of NPA's construction controls division last week. Two District of Columbia boards—Recreation and Education—called on top NPA officials to relax the recreational ban in favor of some D. C. playgrounds. Acting Director Follin had already announced that recreational exemptions are not possible today; the controls division will hold the line, he said.

RAINMAKING IN CONGRESS—Senator Anderson last week introduced his bill to put artificial rainmaking projects under federal license (ENR, Nov. 1, p. 17). The bill won't get anywhere during the short session. It starts the ball rolling for action in the next Congress.

UNANIMITY ACHIEVED—Chairman Morris Cooke is proud of the fact that the seven-man Water Resources Policy Commission submitted a unanimous report to the President. All differences—some of them extremely strong at the start—were reconciled in the end: a fitting accomplishment for a group that recommends unified planning for each river basin.

HELICOPTER SURVEY?—The Buffalo District, Corps of Engineers, may take to helicopters in making a sounding survey of the Niagara Falls rapids—authorized as a result of the new water-diversion treaty between Canada and the United States (ENR, Aug. 3, p. 26). Conventional lead-line or sonic depth-recording methods are out of the question in the treacherous waters above the falls.

UP TO THE LEGISLATURE: Whether or not Indianapolis can issue revenue bonds for its $25 million, four-year expansion of city sanitary plant and sewer lines. The city and Indiana Stream Pollution Board have agreed to the program which would begin next spring. Permission to issue revenue bonds is up to the legislature following a court decision forbidding separate bonding powers to sanitary districts. (ENR, July 20, p. 27.)

FEDERAL POWER FOR HAWAII may be coming. Assistant Interior Secretary William E. Warne has suggested that small hydro plants might be developed there. Opening hearings in Honolulu Dec. 4 on Hawaiian water development possibilities, Warne asked, "The thought of hydroelectric power developments in Hawaii is attractive, isn't it?"

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It not only meets but exceeds the minimum standards set up by ASTM A305-49.
Its proper ratio of bearing to shearing area provides greater bond between the steel and concrete thus providing more efficient transfer of stress at splices and reducing the size of tension cracks. This means a more efficient and better looking structure.
It saves your client's money. In many instances, end hooks can be completely eliminated which means a saving in steel, fabricating and placing costs. Because a single wire loop holds HI-BOND firmly in place—even during pouring of concrete—there are savings in wire and tying time.
It is available for prompt shipment from the Ryerson Company and other leading steel warehouses throughout the middle and far west.
It costs *no more* than ordinary reinforcing bars!
Specify Inland HI-BOND—the reinforcing bar with the built-in anchorage.
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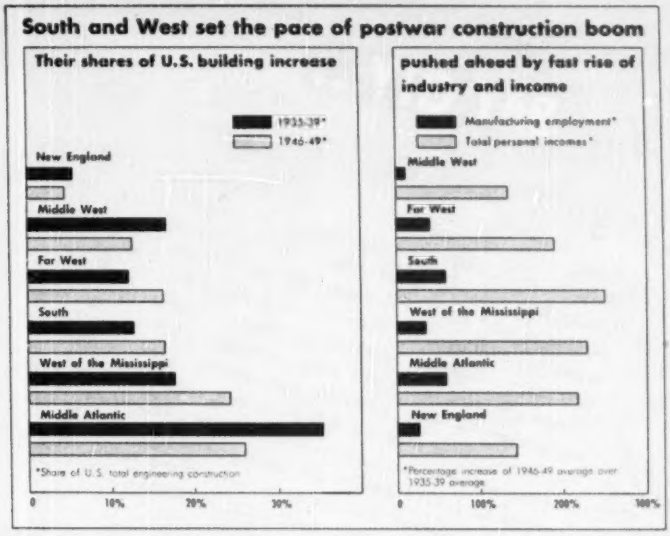
CONSTRUCTION TRENDS



This report—last in a series of seven analyses of regional construction trends—is based on a special economic study made by ENGINEERING NEWS-RECORD

SOUTH AND WEST DO MOST OF POSTWAR BUILDING

ENR reports reveal a dramatic postwar shift in regional shares of U. S. construction. The Northeast and Middle West are losing ground to the Southern and Western regions.

All regions shared the postwar construction boom. But the South and West gained most. In 1946-49, the annual value of new construction averaged 246% above the 1935-39 average in the Southeast, 259% higher in the Far West and 270% higher for the fourteen West of the Mississippi states.

Percentage increases in the other three regions were less than half as big. New England gained 118.7% the Midwest 101.7%, Middle Atlantic states 98%.

As a result, the average share of annual U. S. construction going to the Southeast and West rose sharply —from 42.4% in 1935-39 to 56.8% in 1946-49.

ECONOMIC CAUSES

Basic economic forces caused the shift. Population trends and the rapid growth of incomes and industry combined to push the South and West ahead.

Population was the prime mover in the Far West. The seven far western states increased their population almost four times as fast as the U. S. as a whole, creating a huge new demand for housing and for commercial and public facilities. One result: Far West commercial building, including mass housing, went a fantastic 1440% above the 1935-39 average.

In 1946-49 U. S. personal income averaged 186% higher than in 1935-39. Growing incomes helped pay for new private building in all regions—and incomes grew fastest in the South and West.

Industrial migration supported the trend in construction. U. S. industry has been moving south and west for decades, bringing new prosperity to regions that once concentrated on agriculture and mining. Wartime expansion speeded the industrialization.

Growing industry builds towns. Besides raising incomes, high factory wages lure workers from farms into the cities, creating demand for houses, commercial building, sewers, schools and hospitals.

FUTURE TRENDS

Actually, mobilization should speed the regional shift in construction. During the last war many new defense plants were built in the South and West, where they raised regional incomes and helped produce a big demand for urban construction.

Today the atom bomb is an extra argument for industrial decentralization—so U. S. industry is more likely than ever to put new plants in the wide open spaces.

Though the trend is south and west, there is promise of heavy future demand for construction througout the U. S. Builders still haven't met all the demand from the last upsurge in population and income. A growing need for replacement of old buildings gives contractors a big potential market in the Northeast.

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Smart, performance-wise concerns like Maule Industries of Miami, Fla. have shown by repeat orders that they are getting more for their crane dollars in BAY CITY. The Model 65 shown here, equipped with oversize bucket, is only one of five BAY CITY machines operated by Maule. That's because there's real crane value in a BAY CITY right from the wide, powerful crawlers, through the compactly constructed, full-vision cab, clear to the top of the rugged, pin-connected boom. Your nearest BAY CITY dealer can give you the full story . . . contact him today or write direct to BAY CITY SHOVELS, INC., BAY CITY, MICHIGAN.

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Beginnings of a Water Policy

THE REPORT of the President's Water Resources Policy Commission is titled "A Water Policy for the American People." And while it can be praised in many particulars, the report must be regarded as presenting merely "a" water policy, not necessarily "the" water policy of the nation. Its authors no doubt regard it as the answer to the demand for a national water policy, yet Congress must make the final decision. And before that is done there will be dissenting opinions registered on some of its recommendations.

There is, for example, the already published report of the Engineers Joint Council Water Policy Panel on "the fundamental principles of a sound water policy." One of these principles—agreed to by the 80-engineer panel—is that all control of water and all construction of water conservation projects should vest in the lowest governmental level practicable. The President's commission vests such powers in the federal government—hardly the lowest governmental level. In such differences—and in others of a more detailed nature that are sure to be brought to the attention of Congress—rests a considerable volume of debate that must be digested before a final, sound and sufficiently flexible national water resources policy can be adopted.

The report of the President's commission will nevertheless be universally welcomed as a most useful step in the right direction. In a clear and workmanlike way, it comes to grips with the many-sided problem of water use and conservation. Its recommendations for development on a river basin basis, for controlled coordination of the activities of the different federal agencies, for federal-state cooperation, for the establishment of a federal board of review and for evaluation and cost accounting of each separate unit of a basin project will be widely endorsed.

Less generally acceptable will be the recommendations relative to development of hydro-electric power, which not only place all control in the federal government, but surround non-federal enterprise—state or private— with debilitating threats of federal competition and obstacles to expansion. On the subject of hydro-power the report makes no pretense to reexamination or reappraisal, but merely rubber-stamps the hopes and aspirations of the federal power enthusiasts. In so doing, the commission gives a faithless connotation to one of its own statements, "The American system succeeds only as it encourages initiative, enterprise and a sense of responsibility for the common good." There is more opportunity for constructive partnership among federal, state and private enterprise groups in hydro-electric operations than the commission has let itself consider.

To return to the beginning, this report of the President's Water Resources Policy Commission presents a water policy that deserves careful study and wide discussion. But it is only a first step—albeit a worthwhile one—toward the formulation of "the" policy that a nation with enviable water resources but tremendous needs requires.

Holding the Line

ATTENTION AT THE MIAMI MEETING of the American Association of State Highway Officials was centered on maintaining the nation's investment in highways under the load they will have to carry during the expanding defense program. D. C. Greer of Texas, in his address as retiring president of the association, estimates that from 40 to 60% of all available funds will have to be spent on resurfacing and replacement of existing pavements. Holding the line, rather than attack, will be the order of the day.

Such a situation raises questions that need to be anticipated and planned for if the work is to go ahead expeditiously, as it should. For example, the Bureau of Public Roads and the planning sections of some state highway departments normally require that old pavements, when they are resurfaced, should be widened to meet present-day standards. That is a good rule, but there will be times in the present emergency when it should be set aside in the interest of speed and economy. A highway that is to be replaced under a long-range plan, but which will not survive until it can be replaced unless it is resurfaced, should not have its pavement widened in that resurfacing. The only exceptions would appear to be highways that the local engineers believe should be widened as a safety measure or to increase their traffic capacity immediately.

There will be other instances where time, money and materials can be saved by omitting refinements that are desirable but not essential. Each case will need to be weighed on its own merits. And if that weighing can be done some time in advance of the time when action must be taken, the chance for error in the final decision will be materially lessened.

The fact that numerous expedients of this kind will be necessary during the next few years gives special significance to the recommendation made by Thomas H. MacDonald at the AASHO meeting that a survey be made to determine what highways would have to be replaced during the next ten years. Most highway programs now on the books are designed to provide what appeared to be most desirable at the time they were formulated. If now it becomes necessary to build only what is absolutely essential, as opposed to what is most desirable, many programs may have to be materially revised.

Which curb would you specify

...for greater driving safety?

PICTURE at left shows how New York's Taconic State Parkway *would look* at night with ordinary curb. At right, you see how it *actually does look* with gleaming Atlas White Concrete Reflecting Curb.

Quite a difference! The Atlas White Reflecting Curb is brightly visible. It clearly outlines straight-away and curves on the road ahead. Drivers get a better guide to safer steering.

The right-hand picture was taken on a dry night. In rainy weather, when most visual safety devices are at their worst, Reflecting Curb is at its best. Rain makes the reflection of the saw-tooth faces even brighter!

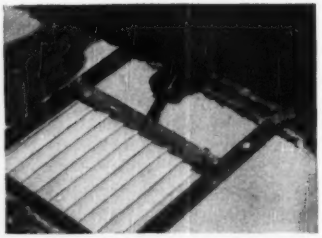
While safety is the prime reason for specifying Atlas White Reflecting Curb, how about—

...ease of construction?

NO DIFFICULTY in installing Atlas White Reflecting Curb. It may be placed wherever curb is called for. On the Taconic job, 84 miles were finished in 6 months. "As much as 4,500 linear feet were placed in a single day."

Their method was fast, simple and efficient. After the Atlas White Duraplastic mortar mix was poured onto a grey cement base, the curbing was screeded to 1-inch thickness and scored with hand tool (pictured right). The air-entrainment feature of Duraplastic made the mix workable and plastic, made placement and scoring easy.

For more information write: Atlas White Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.



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ENGINEERING NEWS-RECORD

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Construction pinch coming; Wilson mobilization chief

President's national emergency proclamation unleashes few new powers, but will speed controls, put industrial expansion under super agency

The state of national emergency is going to speed things up in Washington—and quickly.

Charles E. Wilson of General Electric, whom President Truman established last week end as the boss of mobilization—director of the Office of Defense Mobilization—set the pace, himself. He came to Washington, went to work on Sunday morning in offices just across West Executive Avenue from the White House.

Wilson, in becoming Mr. Mobilization, takes over the plant expansion lending program, and the tax amortization program from the National Security Resources Board. So he's the man who'll pace construction from now on out.

• **Pinch in materials**—The construction industry can expect the new pinch to come soonest in materials. The National Production Authority is readying an order that will make percentage cutbacks in copper use by plumbing and building hardware makers. Also there'll be further cuts in copper used by other industries.

This is the end use limitation you've been hearing about. The government will tell a maker how much copper he can have, and what he must make with it.

NPA expects to have the order out in the next two weeks, or so.

• **Pipe limited**—The order will affect production of all types of pipe containing copper, also radiators and radiator covers from housing and industrial construction—and most plumbing accessories.

There's talk of similar restrictions on use of nickel, zinc, and the essential hardened steel alloy, cobalt.

That's the new tempo so far as metals are concerned. What about prices, wages, and manpower?

• **Manpower in the spring**—The draft is going to start taking 80-thousand men a month beginning in January. That's double the present quota. This won't hit experienced work crews right now, so long as the draftable age is limited to between 19-25.

But the supply of new workers will be shrunk by spring at the 80-thousand a month rate, and you must figure that the quotas will be increased again.

• **Prices**—The first ceilings are in effect, on automobiles. The freeze date is Dec. 1. This is the pattern the government will try to establish as a "voluntary" level until the Economic Stabilization Administration can build up the staff and price-profits standards set up to back up ceiling prices in the future.

Industrial raw materials will be the next to go under ceilings. Representatives from the copper, lead and zinc, and steel industries will meet the first week in January with Stabilizer Valentine and Price Administrator DiSalle to work out pricing programs.

Wage freezes will come along with the price ceilings.

• **More negotiated contracts**—Truman's declaration of a national emergency, by itself, gave the government little extra power. It was mostly psychological—a backdrop for the tougher things to come.

But it does make it easier for the government procurement officers to write direct negotiation contracts, rather than advertised bid contracts. And it gives the government extra say over the way contracts with the government are carried out.

Comprehensive federal water policy recommended in report to President

Water Resources Policy Commission proposes a unified plan for each major river basin with full accounting for all benefits

Development of a unified multiple-purpose plan for use of the water resources of each major river basin as a preliminary to any future federal expenditures in those basins was recommended to President Truman last week by the Water Resources Policy Commission.

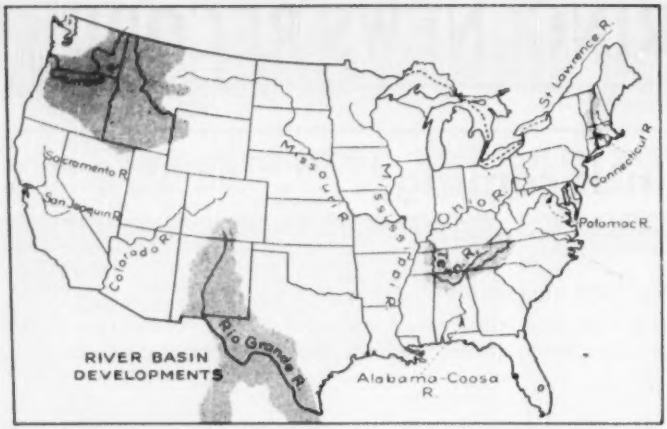
The seven-man commission headed by Morris L. Cooke, consulting engineer of Philadelphia, was appointed in January of this year (ENR Jan. 12, p. 29) to study the subjects of federal participation in the development of national water resources and to outline federal policy toward such development.

The commission's recommendations are contained in a 445-page general report entitled "A Water Policy for the American People." It is to be followed by two other volumes: "Ten Rivers in America's Future" and "Water Resources Law."

Three principal goals are set by the commission in its unanimous report: (1) Unified planning for entire river basins—development of a fully rounded program for each major watershed as a preliminary to any future federal participation; (2) uniform national rules to be applied to all water-resource developments—under complete control of Congress—with separate funds and repayment accounts of each project in each river basin; and (3) a detached review of all projects by a Federal Board of Review appointed by the President. This latter proposal is in harmony with the recommendations of the Commission on Organization of the Executive Branch of the Government (The Hoover Commission).

• **Interagency planning to continue**—The commission recommends continuation of the interagency plan for river basin development such as is being applied to work in the Missouri River Basin pending the reorganization proposed by the Hoover Commission. These interagency organizations would be enlarged to include representatives of state agencies and set up as a river-basin commission under an independent chairman appointed by the President.

Review of all existing federal plans



FOUR BASINS PREVIEWED by the President's Water Resources Policy Commission report in its first volume. Thumbnailed in the commission's current report, are plans for these river basins. They will be outlined in detail in Volume II "Ten Rivers in America's Future" due for release in January. Other rivers with a future: the Colorado, Missouri, Ohio, Sacramento-San Joaquin, the Potomac and the Alabama-Coosa.

Water Resources Policy Report

(*Continued from page 23*)

for river development is recommended, but projects already authorized by Congress would not be affected unless this review indicates that they should not be undertaken. No future projects would be approved until a complete river-basin plan has been evolved and its benefits evaluated by the independent Board of Review.

• **Benefits evaluated**—Setting up a national standards for evaluating these projects is proposed, as are provisions for insuring that the federal government recovers a reasonable portion of its expenditures. This would come in part from state taxes levied on those who receive primary or secondary benefits that cannot be collected directly by the federal government. As to navigation, the commission recommends that the imposition of user charges or tolls on waterways be considered as part of a national transportation policy, based primarily on reimbursing government expenditures.

• **Power development**—Full development of the nation's undeveloped water-power resources, the commission states, "should be considered major federal responsibility." It adds that "Future licenses for non-federal water-power developments should be issued only with the joint consent of the federal agencies responsible for power in basin programs."

The commission, in addition to Chairman Cooke, consists of Paul S. Burgess, dean of the College of Agriculture, University of Arizona; Lewis W. Jones, president of the University of Arkansas; Samuel B. Morris, general manager and chief engineer of the Los Angeles Department of Water and Power; Leland Olds, former member of the Federal Power Commission; Roland R. Renne, president of Montana State College; Gilbert F. White, president of Haverford College.

• **One job left**—The commission still has one more job to do, even with these weighty tomes now out of its way. During January, Chairman Morris L. Cooke and his six co-workers will hold one or more meetings to draft a basic water policy bill for the President. In this one bill will be incorporated the broad principles and policies covering every phase of federal water development. Subordinate issues encountered in individual programs and projects will be taken up in as many supplemental bills as necessary.

After White House review and possible modification, the basic legislation will be forwarded to Congress. It will have a 50-50 chance—or less—for Congressional enactment in 1951-52. In the heat of a preparedness program, Congress may have little time to give to long-range policy thinking.

NOVEMBER HOUSING STARTS

November figure for housing starts is 85,000. The August figure has been revised to 141,900 (upwards from 141,000). The 11-month total now stands at 1,295,000.

Half-billion AEC plant will be near Paducah

"Second Oak Ridge" will require million kilowatts of new power capacity; private companies, TVA to share

A giant new Atomic Energy Commission plant, costing $500 million and requiring new power installations generating a million kilowatts, will be located near Paducah, Ky.

The new AEC facility will literally be a second Oak Ridge. It will have two gaseous diffusion plants for extracting uranium 235 for atomic bombs. Formally announcing the new project Dec. 15, AEC squelched reports that the new plant was to be used for production of the hydrogen bomb.

Raw materials for the H-bomb will be produced at the South Carolina site announced several weeks ago (ENR, Dec. 7, p. 25). Yet to be selected is the location where the attempt will be made to fabricate the new kind of bomb. Best bet remains the southwest, perhaps in Arkansas.

• **The cost breakdown**—The new U-235 plant will be on a 5,000-acre tract 16 miles west of Paducah. AEC officials, seeking funds for the plant as a part of a $1,050,000,000 supplemental appropriations request, testified that $465 million is required for administrative and storage facilities.

Power requirements of the new plant will be 855,000 kw at a 100% load factor, requiring new capacity of at least a million kw to provide minimum reserves. This will be split evenly between the new private power syndicate organizing as Electric Energy, Inc. and the Tennessee Valley Authority.

• **The steam plant**—Location of the new steam generating plants will depend on studies now under way. Electric energy will build either at coal mines 50 miles or so from the Paducah location and transport the power over new transmission lines or build at the new site and transport the coal fuel from the mines. TVA's new steam plant will be in the western end of its system.

The atomic facilities will be operated by Carbide and Carbon Chemicals Division of Union Carbide and Carbon Corp. which also operates the major production facilities at Oak Ridge. Permanent employees at the site are expected to number 1,600 with as many as 10,000 workers required for the peak construction force. The project will be under the direction of R. W. Cook, manager of the commission's Oak Ridge operations office. Cook will establish a Kentucky area operations office. F. H. McGraw Co., New York, has a major construction contract with AEC.

Nathan A. Bowers, ENR, retires after 40 years

Leaves Engineering News-Record after eventful career; as Pacific Coast editor he covered war in the Pacific

Next week Dr. Nathan A. Bowers will retire from the editorial staff of ENGINEERING NEWS-RECORD after 40 years service to pursue, uninterrupted by deadlines, a multitude of scientific interests he has developed over the years.

Nate Bowers joined the staff in 1910 as assistant to the editor of the ENGINEERING RECORD and the next year was made associate editor and placed in charge of the department of hydraulics. In 1913 he went to Vancouver as Northwest editorial representative, and the following year established the office in San Francisco where he has remained ever since. During his early years there he was also Pacific Coast editor for several other McGraw and McGraw-Hill papers, as well as ENR.

Although Bowers entered editorial work immediately after graduation from Rose Polytechnic Institute in Terre Haute, Ind., he had been working at engineering for 8 years previously, and had taken college preparatory work at Throop Polytechnic Institute (now California Institute of Technology) in Pasadena. On this background, an insatiable curiosity and a bent for technical writing, he soon became one of the top notch editors in the country.

A student, above all else, he obtained a Ph. D. from Stanford University in 1926, the first civil engineer to be awarded such a degree by that institution. His thesis was on "Engineering Failures in the Water Power Field," which proved a timely subject two years later when the great St. Francis Dam failure occurred. Dr. Bowers' coverage of the accident was one of the great technical reporting jobs of modern times, and his conclusions as to the cause were later substantiated by investigating boards. He received the editorial award of the Associated Business Papers for his St. Francis Dam articles.

Another opportunity for outstanding reporting was grasped in 1944 when Bowers followed the Seabees in the Pacific, writing of their notable construction accomplishments. His stories form part of the book "Bulldozers Came First."

Never one to be idle, even in leisure, Dr. Bowers earned a federal license as a radio operator in 1920, an airplane pilot's license in 1930 and became proficient as a deep-sea diver. He is an authority on forestry and author of the book "Cone Bearing Trees of the Pacific Coast." He has been president of the San Francisco Engineers Club and has held most of the offices, including president, of the San Francisco Section of the American Society of Civil Engineers. In addition to his editorial duties Dr. Bowers was also vice president and general manager of the McGraw-Hill Company of California from 1930 to 1934. His home, aptly named "Dunmovin," is in Atherton near Palo Alto, California.

Dr. Nathan A. Bowers

Water supply study for Fraser River basin

A large-scale investigation of water supplies in British Columbia's Fraser River basin is being carried out by the B. C. Research Council, in cooperation with governmental agencies, in anticipation of heavy industrialization of the area.

The work is being done to assist long-term planning for the area, which includes the southern outskirts of Vancouver, and the New Westminister district.

A special mobile research laboratory has been equipped for field analyses to test water properties. More complicated analyses are performed in research council laboratories.

Results are being used in planning sewage disposal systems, sites for future industries, protection of domestic water supplies from pollution, etc. The work is also important to the fishing industry.

Financial support for the studies is being given by the Dominion-provincial board for the Fraser River basin, the water rights branch of the provincial department of lands and forests, the federal government and the Vancouver & District Joint Sewerage and Drainage Board.

New York contractors get defense forecast

Cotter urges healthy industry in private hands; Cole predicts tough controls; Proctor states objectives

In a meeting overshadowed by the grim prospect of a national emergency big construction employers of New York State met last week to hear equally grim facts of life under which their business may have to operate.

The contractors—who form the Building Industry Employers of New York State—met in New York City. They elected Francis Byrne, head of the Byrne Construction Co., Syracuse, president, to succeed Hugh M. Hughes, of New York.

Keynote of the meetings was sounded by the three principal speakers: Rear Admiral Carl H. Cotter (USN ret.), president of Merritt-Chapman & Scott Corp.; Richard Cole, a member of the National Joint Board for Settlement of Jurisdictional Disputes; and Carlton S. Proctor, of Moran, Proctor, Freeman and Mueser.

• **Two programs**—"Each passing day," Adm. Cotter said, "makes it clear that the United States faces the urgencies of two overlapping defense programs, rather than one: The first geared to the present, the second for the future.

"Only one answer presents itself: The country's productive capacity must be stepped up to the point where it can meet without strain both the demands of . . . military requirements and . . . expanding civilian economy."

He made a strong plea for maintenance of the industry in a healthy condition and in private hands.

Adm. Cotter suggested a five-point program for the industry: Planning ahead for greater mobility in terms of preparedness to enter new fields of construction; advance planning against a drain on supervisory personnel; emphasis on conservation of materials; work to minimize maintenance problems; realization that problems are national and long-term.

• **Tough and fast**—Mr. Cole told contractors that forthcoming controls will be "more complete, come quicker, and be a lot harsher" than anything yet.

He felt that control will start with materials and prices and will include wages and manpower.

• **Russia**—Mr. Proctor, drawing on his experiences with engineering in Russia during the early '30's, told his listeners that the Russians are capable of learning fast, but do not, as a body, support the actions of their leaders.

Turning to U. S. problems, he said: "To quickly reestablish our armed strength is the first objective of every citizen . . . and . . . . it can't be accomplished without self-sacrifice.

CIMA proposes advisory group to insure construction equipment supply

Manufacturers' association stresses need for maintaining large-scale production—Survey of material requirements under way

Attention was focused recently upon the increasingly serious problem of keeping production of construction machinery and equipment at a high level in the best interests of mobilization for defense.

In a letter to William H. Harrison, administrator of the National Production Authority, Ralph K. Stiles, president of the Construction Industry Manufacturers Assn., suggested that there be formed immediately an advisory committee consisting of one member from each of the 16 major segments of the industry. It would be named the Overall Construction Industry Manufacturers' Advisory Committee.

CIMA officials feel that the time for action is at hand and base their request on the strength of recent and urgent inquiries from member companies for assistance. The association proposes that, if necessary, current government formulas to "secure proper and effective representation" be disregarded.

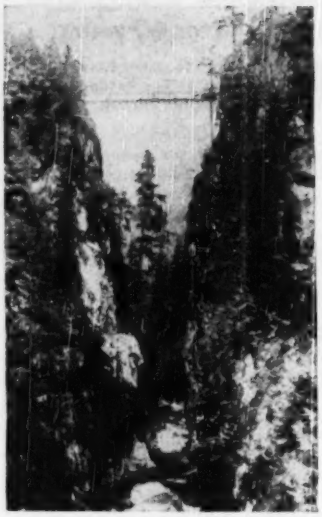
• **Vital to military too**—Mr. Stiles emphasized the need for maintaining large-scale production of construction machinery and equipment by pointing out that such products are vital to military construction and to the civilians supplying combat and defense needs. Listed as particularly important were highway construction and maintenance, mining, railroads, logging, oil and gas production and transportation, chemicals and heavy industrial plants.

Each member of the proposed committee would be a group leader representing the companies in his own particular field and could advise intelligently on the needs of that segment of the industry.

There have been a number of informal discussions between NPA officials and a CIMA task committee was instructed last July to "stand by for instructions."

• **Material survey**—In preparation of a detailed report for NPA—and to protect the interests of its members in every way possible—CIMA started a survey of material requirements of the industry. This information is being gathered on a confidential basis and is planned as the advisory committee's first piece of business with the government.

The 16 major segments of the construction machinery and equipment manufacturers' industry to be represented on the proposed committee by one member each are: Bituminous equipment; crushing equipment; concrete equipment; cranes, shovels and excavators; drills; loaders; motor graders; pumps, contractor's; rollers and compactors; scrapers, hauling; tractors; tractor-allied equipment; trucks and trailers-off-highway hauling equipment; portable air compressors; miscellaneous equipment; and construction machinery distributors.



GORGE VIEW—Site of new dam in Capilano River canyon, near Vancouver, B. C. Dam will rise 325 ft in the narrow gorge—some 60 ft higher than suspension bridge shown. It will impound 48,000 acre-ft of water in the 3.5-mi valley beyond and is designed to supply water for the Vancouver area for years to come. Construction is slated to start next March.

AGC fights state license for building contractors

The Texas Associated General Contractors have passed a resolution opposing legislation designed to put contractors under licenses similar to doctors and lawyers.

Roy Kitchens of Austin, retiring president of the AGC executive council, has four objections to legislation.

1. It would eliminate "piece work" by construction workers, and require that they be paid hourly wages on all jobs. The council contends this would raise the cost of home-building.

2. Similar laws in other states have become "political footballs." They have been unsuccessful.

3. The proposed law has not been drafted by and does not come from the contracting industry itself.

4. Under the new law persons not recognized as contractors by the AGC would be licensed.

"We recognize the fact that a lot of construction is done by people who are not recognized builders," Kitchens says, "but we don't want a law that would license that sort."

Behind the new proposal have been complaints from individual veterans and the Veterans Administration on poor workmanship in some VA-financed homes.

SNAKED OVER THE GRASS—Lines of interlaced fire hose bring water from the St. Joe River in Fort Wayne, Ind., to fill a small reservoir for fire-fighting purposes. A clogged intake valve, which shut off the city's supply for 13 hours, made the emergency supply necessary. (Wide World Photo)

CONSTRUCTION BUSINESS

Industrial expansion topped by Texas

The biggest industrial building program in history has been under way in this country since World War II.

Ten states account for 60% of this major industrial expansion. Twenty-one metropolitan areas account for 41% of the major new building from July 1945 through June 1950.

These facts and others come out of an analysis by the Territorial Information Department, Chicago, of 3,270 industrial construction contracts reported in ENGINEERING NEWS-RECORD. These contracts amount to more than $2.8 bilion and show trends in the movement and development of American industry.

The industrial building contracts studied were limited to those for $100,000 or more, so do not record the smaller plants. They exclude also numerous warehouses and non-manufacturing facilities built by industry during the five years.

• **Geographical character of expansion** —Half of the expenditures in new plants are in the eastern and middle-western industrial states and usually in, or near, long established industrial areas. But much decentralization is evident, also movement to new markets, to essential raw materials or to fuel or power source.

The south, spearheaded by Alabama and South Carolina, and the southwest, spearheaded by Texas, have had the largest plants. Contracts studied in those areas averaged more than $1 million dollars each, whereas in the east and middle-west new plants or plant additions were smaller, but more diversified as to type of industry.

Rate of capital expenditure by region

Region	Percent of Total Value Contr	Percent of Total Prod. Wkrs*	Aver Invest Per Wkr
United States	100.0	100.0	$336
New England	2.7	10.5	59
Middle East	19.3	30.0	181
Southeast	18.0	14.6	291
Central	28.0	34.3	193
Northwest	3.8	1.7	519
Southwest	17.2	2.5	1,592
Far West	11.0	6.3	415

* Census of Manufactures — 1947

The rate of capital expenditures for production facilities varies widely by regions. A measure of this can be computed on the basis of the average investment per production worker.

The rate-of-capital-expenditure table by regions shows that although large amounts are being invested in the relatively new industrial sections of the country, the majority of industrial expenditures continue to be made in the longer established manufacturing centers.

Industrial expansion: by states—July, 1945 through June, 1950

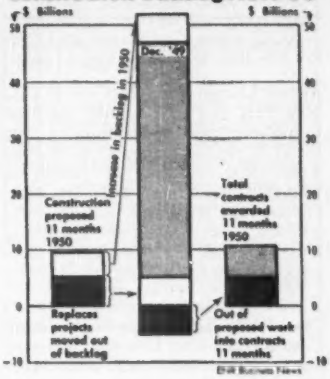
State	Contracts Awarded†	Value (In Millions)	Percent of Total Value of Contracts	Percent of Total Production Workers*	Average Investment Per Worker
United States	3,270	$2,811.4	100.0	100.0	$ 236
Texas	374	438.3	15.6	2.0	1,811
California	357	258.9	9.2	4.4	488
Ohio	236	244.8	8.7	8.3	248
Pennsylvania	280	236.0	8.4	10.2	194
Illinois	302	176.4	6.3	8.0	185
Michigan	97	113.2	4.0	6.9	138
New York	84	109.4	3.9	12.0	77
New Jersey	93	99.2	3.5	5.1	165
Alabama	50	68.2	2.1	1.6	475
South Carolina	41	75.3	2.7	1.5	429
Other States	1,356	971.7	34.6	40.0	204

by metropolitan areas

Metropolitan Area	Contracts Awarded†	Value (In Thousands)	Number of Production Workers	Average Investment Per Worker
Total	1,435	$1,150,448	5,007,279*	$ 230
Pittsburgh	85	147,211	284,017	518
Chicago—Gary	278	146,825	756,115	194
Houston	100	126,887	46,001	2,732
New York—N. E. New Jersey	102	107,756	1,274,357	85
Los Angeles	141	94,897	281,806	336
Detroit	45	84,780	466,922	182
Philadelphia	119	70,777	427,863	165
San Francisco—Oakland	96	62,929	131,161	480
Cleveland	90	57,631	218,929	263
St. Louis	84	45,790	200,123	229
Milwaukee	83	31,774	141,172	225
Baltimore	54	28,218	138,810	203
Toledo	26	24,696	56,730	435
Kansas City	17	20,080	61,698	325
Youngstown	18	19,779	94,263	210
Minneapolis—St. Paul	58	16,113	93,986	171
Cincinnati	11	14,837	108,476	137
Indianapolis	20	13,987	73,168	191
Albany—Schenectady—Troy	4	12,219	55,023	222
Atlanta	32	12,087	40,505	298
Wheeling—Steubenville	12	11,812	46,484	254

† Reported by Engineering News-Record, $100,000 and more in size
* Production Workers—Census of Manufactures, 1947
Note—Definition of areas revised in accordance with Census of Manufactures—1947
—Analysis by Territorial Information Committee, Chicago

Proposed Engineering Construction Backlog Nov. '50



$1 billion more in backlog

More proposed construction was added to the backlog in November than in any month this year. This boost to the backlog topped $1,005 million. In March only $16 million was added, in January $649 million, the largest addition of the year up to November. This brings the measured backlog as reported by the CONSTRUCTION DAILY up to $51,989,596,000 in construction proposed but not yet put under contract.

The net gain for 11 months is $4.7 billion. This results from a gross total of $9.8 billion in new engineering construction projects proposed in the first 11 months. But projects valued at $5.1 billion moved out as they were put under contract to proceed with construction, thus a corresponding volume of new projects were needed just to hold the backlog at the same size. Only the surplus proposed work over the amount moved into contract awards increases the backlog.

The large November boost came from these sources: $340 millions in proposed industrial buildings; $200 millions in private unclassified construction; $175 million in streets and roads; $100 million in public buildings; $90 million in commercial building housing; $16 million in public unclassified; $10 million in bridges.

How the backlog is distributed is shown in the accompanying tables.

Proposed construction backlog on record with ENR November, 1950

Type of construction	Billions
Waterworks	$1.4
Sewerage	2.2
Bridges	1.6
Streets, roads	4.6
Reclamation, waterways	7.3
Unclassified, public	4.7
private	5.6
Buildings, public	12.0
commercial and mass housing	6.9
industrial	5.6
Total	$52.0
New England	2.5
Middle Atlantic	13.0
South	5.9
Middle West	8.4
West of Mississippi	13.3
Far West	9.0

BIDS AND BIDDERS

(Major project news received after Construction Reports, page 62, went to press.)

Atomic Energy—F. H. McGraw & Co., New York, has been awarded contract to construct plant at Paducah, Ky., for the U. S. Atomic Energy Commission. Total estimated cost of project is $500,000,000. Giffels & Vallet, Inc., Detroit, and Sargent & Lundy, Inc., Chicago, are consulting engineers. Union Carbide & Carbon Corp., Chicago, will operate plants.

Community Center—T. B. Hubbard Construction Co., Houston, has just purchased site in Houston for $10,000,000 community center.

Barracks—Peter Kiewit Sons Co. and Morrison-Knudsen Co., Inc., Seattle, Wash., were low at $10,288,413 for constructing barracks at Eielson Air Force Base and Ladd Air Force Base, Alaska. U. S. Engineers, Anchorage, opened bids Dec. 13. Their estimated cost of project was $8,436,840.

Power Plant—Wisconsin Public Service Corp., Green Bay, Wis. awarded contract for superstructure of power plant addition, at Green Bay to C. R. Meyers & Sons Co., Oshkosh, to cost $1,500,000. The total cost of plant with equipment will be about $8,000,000. Pioneer Service & Engineering Co., Chicago, is engineer.

Wyandotte Worsted Co., Waterville, Me. plans to build a woolen manufacturing plant at Lakeview, near Southern Pines, N. C. Cost will be from $4,000,000 to $5,000,000.

Auto Assembly Plant—William P. Neil Co., Los Angeles, will design and construct auto assembly plant at Maywood, Calif., for the Chrysler Corp., Los Angeles. Estimated cost is $5,300,000.

Power Plant—Southwestern Public Service Co., Dallas, plans $6,000,000 electric plant, 4 miles south of Earth, Tex.

Schools—Ventura Union High School District will hold an election Feb 6, to vote $5,570,000 bonds for junior college, junior high school, gymnasium and swimming pool, at Ventura, Calif.

Housing—Newark Housing Authority, Newark, N. J. awarded a $5,135,000 contract to Terminal Construction Co., Woodbridge, N. J. for nine 8-story low cost housing project. Kruger & Fava, Newark, are architects.

Blast Furnace—Freyn Engineering Co., subsidiary of Koppers Co., Pittsburgh, will design and build 480,000 ton-per-year blast furnace at the existing plant of the Great Lakes Steel Corp., unit of National Steel Corp., at Zug Island plant on Detroit River, near Detroit. This is part of announced $42,833,800 expansion program for owner.

Housing—City of Boston Housing Authority, Boston, Mass. received a low bid of $4,298,452 from M. S. Kelliher Co., Boston, for construction of East Boston Housing project. M. A. Dyer, Boston, is architect.

Auditorium and Garage—City of Kansas City, Mo., plans to build an auditorium and garage to cost $4,164,459. The garage will provide an A-bomb haven. John E. Maring, city engineer.

Road—The Horvitz Co., Cleveland, was low at $3,418,797, for road improvements in Cuyahoga County, when the Ohio State Highway Department, Columbus, opened bids Dec. 12. The work includes twin four-lane roadways, clover leaves, underpasses, a tunnel and a bridge.

College Building—James McHugh Construction Co., Chicago, will construct college buildings at Alverno College for Women, at Milwaukee, for the School Sisters of St. Francis, Milwaukee. Cost will be about $3,000,000. Maguolo & Quick, St. Louis, are architects.

Housing—New York City Housing Authority plans Redfern Housing Project at Far Rockaway, N. Y. Estimated cost is $4,337,383. Andrew J. Thomas, New York, is architect.

Roads and Bridge—Texas State Highway Commission, Austin, received low bid Dec. 13, for improving 2.32 miles road in Harris County from Gulf Bithulithic Co., Houston; F. M. Reeves, Austin and Texas Bithulithic Co., Dallas, $2,569,086. For superstructure on Neches River Bridge, in Orange Co., Texas Construction Co., Dallas, was low at $2,987,989.

Apartment—River House Trust, Boston, will construct a $2,000,000 apartment in Boston. Contract has been awarded to Schein, Cohen Construction Co., Boston and E. T. Steffian, Boston, is architect.

COSTS AND VOLUME

ENR INDEX NUMBERS

Index Base = 100		1913	1926	1949
Constr. Cost	Dec.'50	528.73	254.16	110.84
Bldg. Cost	Dec.'50	390.14	210.89	110.90
Volume	Nov.'50	410	167	118

Activity This Week

As reported to ENR (in millions of dollars)

Figure for 1950—692

Amount of contracts let

Week of Dec. 21, '50		Cumulative 51 wks 1950	1949	% chge
Federal	$509.3	$1,893.7	$1,178.2	+61
State & Mun.	70.3	3,724.7	3,081.0	+21
Total Public	$579.6	$5,618.4	$4,259.2	+32
Total Private	112.4	6,622.0	3,831.3	+73
U. S. Total	$692.0	$12,240.0	$8,090.5	+51

Contracts by type of work

	This Week	Cumulative 51 wks 1950	1949	% chge
Waterworks	$3.6	$213.8	$205.8	+ 4
Sewerage	3.8	286.0	274.3	+ 4
Bridges	6.5	364.3	350.9	+ 4
Highways	14.0	1,247.2	885.9	+41
Earthwork, Waterways	3.9	415.4	519.2	−20
Buildings:				
Public	521.9	2,387.0	1,359.0	+76
Housg., pub.	21.3	347.3	366.7	− 5
Housg., priv.	52.3	3,104.7	1,817.8	+71
Commercial	15.5	962.2	565.4	+70
Industrial	40.7	1,660.9	944.7	+76
Unclassified	8.5	1,251.8	801.0	+56

NOTE: Minimum size projects included are: Waterworks and waterway projects, $28,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

New capital for construction

	Cumulative 51 wks 1950	1949	% chge
NON-FEDERAL	$522.0	$432.5	+21
Corporate Securities	2,534.4	2,145.6	+18
State and Mun.:			
Excl. housing	2,315.1	2,106.6	+10
Housing	681.7	822.4	−17
FEDERAL	2,829.1	1,711.7	+65
Total Capital	$8,882.3	$7,218.8	+23

More roads for load tests top need of states; BPR-State inspections seen

Bituminous surface load tests needed in far and south west—concrete tests in midwest; joint state-BPR inspection trips suggested

Overloaded trucks, pavement maintenance, and federal and state emergency measures to protect the Nation's investment in good highways were discussed in technical committee sessions during the recent meeting of the American Association of State Highway Officials in Miami. (See p. 23, EN-R, Dec. 14, for a report of the meeting's highway-policy proceedings.)

• **More test roads**—The need for additional tests of the effect of frequent repetitions of various axle loads on highway pavement, similar to the test now nearing completion in Maryland, was discussed at the opening meeting of the Committee on Administration. Tests on bituminous surfacing in the far west and southwest are desired, also a test on a concrete road in the midwest. Representatives of states in those regions agreed to seek the necessary authorization of funds for such tests at an early date.

• **Closer cooperation on maintenance**—How to get closer cooperation between the states and the Bureau of Public Roads on maintenance matters was actively debated by the Committee on Maintenance and Equipment. Most speakers favored a return to the plan followed in the past in many states under which responsible state officers accompanied the bureau's inspectors, which has largely been dropped due to changes in BPR personnel. Deficiencies noted then can be discussed on the job and decision reached as to a solution. Such a plan saves much red tape and report writing and gets results more quickly, according to those in the discussion.

• **Pavement resurfacing**—During this discussion the matter of resurfacing old pavements during the present emergency was raised by Rex Whitton of Missouri because BPR inspectors favor widening pavements when they are being resurfaced. Mr. Whitton said that no arbitrary stand should be taken on the matter by the bureau because there are times when resurfacing is needed to preserve the pavement, yet widening is not justified.

Similar views were expressed by R. H. Baldock of Oregon, chairman of the committee. Generally, Baldock said, he favors widening, but at a time like this when most of the available funds must be spent on keeping the existing roads in service without wasteful expenditures on maintenance, resurfacing without the added cost of widening should get BPR approval.

• **Sealing joints with rubber**—Minnesota has had great success in sealing cracks and joints in concrete pavements with rubber compounds, according to Charles L. Motl, maintenance engineer of that state. His department now is doing much of this work by contract and has found the contract work to be very satisfactory.

Contractors have developed machines for cleaning out cracks and for widening them where necessary. They aim to get the rubber down to a depth of ¾-in. This requires about 0.4 lb of rubber per foot of crack or joint. Contractors are paid on the basis of the number of pounds of rubber used.

Mr. Motl said they are considering giving the same form of treatment to all contraction joints and longitudinal joints in their new pavements because it has been so satisfactory on old pavements.

• **Contract maintenance**—Mr. Motl's statement that they did this work by contract started a discussion of doing other types of maintenance work by contract, which brought out the fact Minnesota hires motor graders from local contractors in winter months for clearing packed snow and ice from pavements.

The state has regular proposal forms that are sent to all contractors owning such graders. Each contractor who submits a proposal for use of his equipment has his location spotted on a state map to facilitate reaching him quickly when his help is needed.

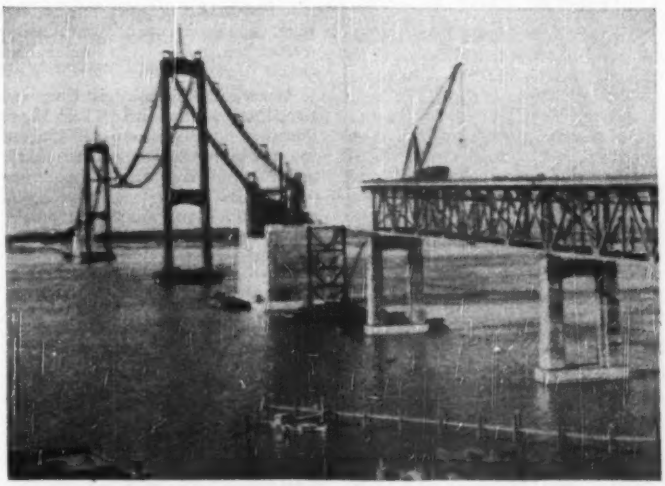
D. N. Steward of Colorado said they have a similar arrangement there but it is an all-year-round proposition.

His department maintains a list of road equipment owned by local contractors and rents equipment in summer as well as in winter if the contractor is not using it when the state needs any particular piece of machinery.

Overweight vehicles

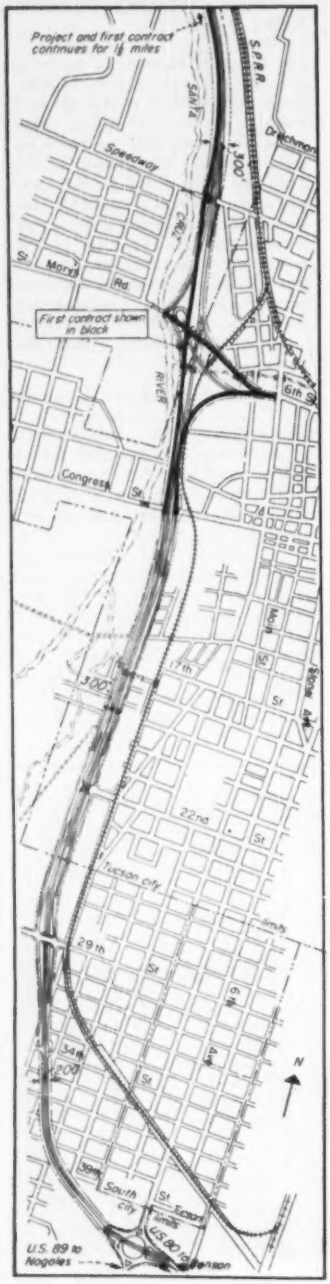
(Newly announced policy of the Department of Defense concerning movement of overweight on oversize military vehicles.)

"(a) Except in instances of overriding and urgent military necessity, no vehicular movement which exceeds any legal weight or size limitation will be undertaken over public highways by or for agencies of the Department of the Army, the Navy, or the Air Force unless prior permission is granted by the state or states concerned upon request of authorized representatives of the military department. Permits for movement of commercial vehicles will be requested only after determination has been made that military necessity requires movement by the mode and manner selected."



CABLE SPINNING—Work on the cables for the Delaware Memorial Bridge, below Wilmington, goes on from seven in the morning until eleven at night. American Bridge Co., the contractor, plans to complete spinning by Jan. 1, providing the weather is cooperative. The $40,000,000 structure is to be opened to toll traffic July 1, 1951.

Tucson begins freeway to remove truck traffic from city streets



ARIZONA'S FIRST freeway-type facility will take trucks and other traffic around Tucson's central business district.

Award of a $407,815 contract last month for 3 miles of a controlled access highway through the city of Tucson puts the Arizona Highway Department in the freeway building business for the first time. The initial contract, which went to Western Constructors, Inc. of Phoenix, will provide first stage construction for about half of the 6.7 miles in the complete project.

"First Stage" means that one of the two divided roadways will be built from the north city line to a point opposite the central business section. From this point south, for most of the balance of the project, there will be eventually four roadways—the two main lines flanked either side by local access roadways.

• **Truck artery**—The project—designed for 20,000 vehicles per day at 50 mph—is frequently referred to as the Tucson Truck Freeway since its most important purpose is to remove truck traffic from the city's principal north-south arteries—Stone Ave. and South Sixth Ave.

It is located parallel to the city's western boundary in a blighted area between the railroad tracks and the Santa Cruz River whose course will have to be altered in a few places to make sufficient room for the 300-ft right-of-way.

Tucson's central business district is the ultimate destination of a large percentage of traffic approaching the city. The new road is designed to carry this traffic along the edge of town, until it reaches one of the seven interchanges closest to its destination.

At present, traffic must use congested city streets all the way. This congestion is in fact the reason why Tucson was chosen for Arizona's first freeway. South Sixth Ave., for example, carries 24,000 vehicles per day, 4,000 more than it should and more than any other single street in the state. Tucson traffic in general has doubled in the last 10 years. The need for relief is immediate.

E. V. Miller, assistant deputy state highway engineer of Arizona, in discussing the project before the ASCE in Tucson said that the planning of such freeway facilities is a definite part of the state highway department's future program. Although money will be limited for immediate large construction programs, Arizona is attempting to provide wide rights-of-way for any routes that might require them, even 20 or 30 years hence in a long-range program.

Review of design asked on Chesapeake Bay bridge

Backwash of hurricane damage to the Chesapeake Bay bridge (see p. 30 ENR, Dec. 14, for damage details):

• **Speculation** on the whereabouts of a barge loaded with "master" fabricated steel piles, and whether or not locating the barge will locate the valuable steel.

If the barge spilled its cargo at various points as it was buffeted about the bay by winds of near hurricane force, some of the pilings may never be recovered.

• **The battering ice**—Announcement by Governor-elect McKeldin that he will push a study to determine whether the bridge design is sufficient to take the battering of ice, wind and waves of the often storm-swept bay.

"In determining on such a study," McKeldin said, "I wish it clearly understood that this is not fault-finding but fact-finding."

"It may be that the expenditure of an additional $2,000,000 to $4,000,000 may prove needed to insure the stability of the structure," he said.

• **Dollar damage**—No official estimate of damage sustained by the bridge now under construction is available.

The State of Maryland is amply protected against financial loss.

Agencies get the DO's

Recently ENGINEERING NEWS-RECORD explained how to apply for Defense Orders and M-4 ruling (No. 30, p 29). The U. S. Department of Commerce points out that individual suppliers apply for DO's only for production equipment. For construction materials, the DO is issued by the contracting officer at the time a contract is awarded.

Court delays motor fees on contractor equipment

District Judge Jack Roberts has issued a temporary injunction against collecting motor vehicle taxes on equipment used in road work after hearing arguments advanced by Texas highway construction contractors.

Contractors fought payment of motor vehicle license fees on road machinery. According to state attorneys, an estimated $1,000,000 of annual revenue is at stake.

Had the state won, it was also expected to demand payment of the one percent sales tax on motor vehicles.

Contractors contend that road equipment cannot be classed as "motor vehicles" as set forth by Texas law (ENR Nov 9 p 24).

ASCE group proposals for seismic hazards

Earthquake committee of Seattle has four-point plan for safety during quakes; hits "monumental" school buildings

The American Society of Civil Engineers has a four-point program to protect life and property in the Pacific Northwest against future earthquakes.

Pointing out the 1949 earthquake would have resulted in the loss of 5,000 lives and $100,000,000 in property had it lasted only a little longer, ASCE's earthquake committee of Seattle, Wash. calls for legislation on two of its proposals. First it would have potential earthquake hazards removed by a specified time. Second it would have owners along main thoroughfares responsible for damage during seismic disturbances.

Third, useless, superficial and dangerous ornamentation should be removed from building, and fourth, the seismic design sections of the Pacific Coast Uniform Building Code adopted, the committee says.

• **The too fancy school**—School design came in for special criticism. "Ornamentation and appearance seem to transcend structural safety," the committee reports. "This is due to . . . disbelief on the part of designers that seismic hazards exist . . ."

Targets of school building criticism: high ceilings; large rooms; high windows; ornate entrances embellished with heavy and loosely placed terra cotta, brick and stone.

Urging action before another quake sends fractured walls of school and buildings about the ears of children and citizens, the report warns that lack of action would make death traps of many structures in Seattle.

Local school officials have answered the report of the ASCE committee. All new school buildings, they say, are being made quake resistant.

Deschutes River Dam site is tentatively chosen

Site for a dam designed to control flow of the Deschutes River above Bend, Ore., and to provide storage water irrigation has been tentatively selected at Benham Falls by the Bureau of Reclamation.

The Bureau's chief engineer has approved a report prepared by a board of geologists headed by Charles P. Berkey recommending the Benham Falls site. Other members of the board were T. P. Ahrens and W. H. Irwin of the geology and research division of the chief engineer's office in Denver; C. J. Okeson, regional geologist, and Dr. R. T. Russell, Salem geologist.

SWEDISH LANDSLIDE—Recently, Engineering News-Record published a press-service picture of houses, in Surte, Sweden, that had been carried topsy-turvy on a sliding stratum of clay. (ENR Oct. 19, p. 33). Here is a vertical airphoto of the whole slide. Two dredges work to clear the navigable river Gotaalv; highway (top route) and railway reconstruction proceed (houses below the road had been above); maximum subsidence from slide, near top of picture, is about 35 ft.

Saturated stratum floated clay away

Indian Service to start new irrigation work

The Bureau of Indian Affairs of the U. S. Department of the Interior has started a construction program to complete the long standing Wapato irrigation project on the Yakima Indian reservation near Toppenish, Wash.

Plans and specifications are being prepared in the Portland area office of the Indian Service for construction of two pumping stations, together with a third complete pumping station for a high area within the project. Other plans are being prepared for three large reinforced concrete structures for the enlargement of the canals and to provide controls for the pumping stations.

The Indian Service plans to open bids on these items during the latter part of December.

The Irrigation project in the Yakima reservation was first authorized by Congress in 1906.

Houses slid as far as 420 ft early this fall in a landslide at Surte, in Sweden. Information on conditions of the slide come to ENGINEERING NEWS-RECORD from G. Westerberg, chief director of the civil engineering department in the Swedish State Power Board, in Stockholm, Sweden.

The affected area is roughly 1,100 by 2,100 ft, dropping about 100 ft from top of slide to river. It is surrounded by rocky hills. The soil consists of a top-layer of dense clay, underlain by sandy clay and fine sand.

Heavy rains saturated the pervious strata under the clay, eventually building up artesian pressures that "floated" the relatively impervious clay stratum. Earth movement began farthest from the river, where ground slopes were steeper. Final profile was as much as 35 ft below original grade in the slide's upper half, as much as 10 ft above original grade in the slide's lower half.

"The whole sliding phenomenon took place in a few minutes," Westerberg states.

Another surrender at Yorktown

• Foundation contractors conquer swift-running York River by use of ingenious rigging and planning know-how to plant first of six caissons for Yorktown bridge at 150 ft depth through 80 ft of water.

LORD CORNWALLIS could have used the new bridge whose foundations are now under construction in the York River in Virginia. It was just 169 years ago in October that his attempt to ferry British troops from Yorktown to Gloucester Point was thwarted by the American and French canoneers. His famous surrender to General George Washington followed a few days later.

Whimsical though such an allusion may be, it is not out of keeping with the reminders of those early days that crop up on one of the nation's top construction jobs—that of sinking six steel caissons in the deep and swift-running York, forcing its surrender to modern construction techniques.

Dredging in the mud, sand and silt of the river bottom frequently has brought up old ship timbers, even curious hardware that may have come from the British warships *Charon* or *Guadeloupe* or some of the transports that comprised the fleet that could not save Cornwallis—and was burned and sunk by red-hot shot from the shore batteries. On the Yorktown heights near the south abutment are some of the rebuilt redoubts used in the Revolutionary War battle. These, too, help to keep alive memories of the earlier events that took place at the very bridge site.

It is probably also true that not since Washington's troops lined the banks and cheered as the *Charon* burned has there been such anticipatory excitement as occurred on the day that the first caisson for the bridge arrived in tow and was moored to its guide towers in the river. It was no ordinary caisson. The tallest ever prefabricated—110 ft—it was also destined to be lowered through a near record depth of water—80 ft—and than sunk 70 ft farther into the river bottom. None of the other five caissons is less than 95 ft high and two of them must also penetrate 80 ft of water.

Heretofore, San Francisco Bay has monopolized attention as the deep water habitat of bridge piers, but only one of those on the Bay Bridge is in water as deep as 80 ft. Moreover, for none of the Bay Bridge foundations was the ratio of water depth to narrowest caisson dimension as great and therefore as daring as at Yorktown.

• Plan of attack—Construction procedures at Yorktown are in keeping with the record-breaking characteristics of the caissons themselves.

The contractors have developed a unique system of welded pipe framing to perform the dual functions of anchoring and guiding the caissons during sinking. The construction plan includes an unusual steel cofferdam to extend the height of the caissons after their cutting edges penetrate about 15 ft into the river bottom. And, finally, concrete from a shore plant through a highly efficient transportation system that involves as many as five different handlings of each batch—from batchers to forms in 20 minutes.

• Notable Bridge—The reason for all this foundation work—which Massman Construction Co., and Kansas City Bridge Co., got the privilege of carrying out by surprising all of the big eastern contractors with a $4,690,232 bid—is to support a superstructure that is notable in its own right. In its 3,750 ft length between abutments it contains girder span approaches and 2,740 ft of truss construction over the

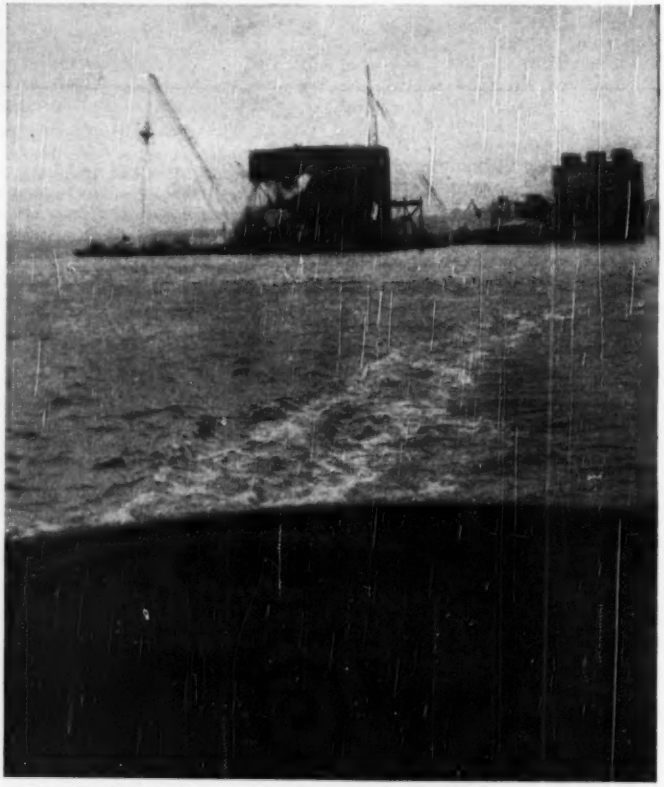


FIG. 1. TWO STAGES of pier sinking at Yorktown. In the foreground, dredging is under way in a caisson already landed on the bottom and topped with cofferdam extensions. Beyond is a caisson just arrived from the shipyard and drawing 33 ft in the 80 ft deep water.

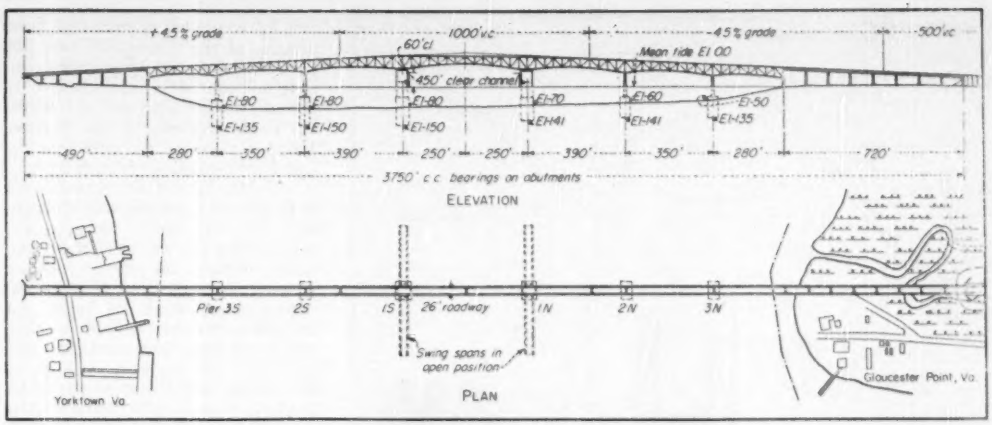


Fig. 2. PLAN AND ELEVATION of Yorktown Bridge which will be distinguished by two 500 ft long swing spans placed end to end.

river, which includes two 500-ft swing spans. Placing two swing spans end to end is a novel if not unique arrangement, and was adopted in order to provide a 450-ft clear shipping channel for vessels serving Navy installations upstream. The swing span trusses are detailed to resemble the adjacent fixed truss spans so that the bridge presents an uninterrupted silhouette from shore to shore.

The bridge, which will carry U. S. Route 17 across the river in place of the existing ferry, is a project of the Virginia State Highway Department, and is being financed by toll revenue bonds. It is to be called the George P. Coleman Memorial Bridge in honor of the state's second highway commission chairman, and is scheduled to be completed in 1952.

• **Pier Design**—Investigation of the soil strata on which the piers were to be founded established a maximum allowable bearing value of 3.5 tons per sq ft in excess of that resulting from the weight of the existing over-burden. For piers of the size required—the highest is 210 ft tall—this was an unusually low bearing value since as a maximum it necessarily included the effects of all horizontal as well as vertical forces on the bouyant pier. The design of the piers, therefore, was one of the major problems facing the consulting engineers, Parsons, Brinckerhoff, Hall & Macdonald of New York.

Hollow construction is used for all the pier bases, and even the shafts of the pivot piers are hollow. The bases are light but rigid reinforced concrete boxes having exterior walls 4 ft thick and 3 ft interior walls, which brace and support the exterior walls. During the final stages of construction a top and bottom are added to each box.

To construct such pier bases, the engineers specified the open-dredge caisson method. And, because some of the caissons would have to be sunk to a depth of 110 ft or more before reaching soil sufficiently firm to support them, the engineers also required that steel caissons be used as the only type of construction that would stay afloat at that depth.

Caissons are ordinarily regarded as construction equipment, and the design is left to the contractor. But in this case the problems of designing the piers and the caissons—together with the relation of each to the sinking and sequence of construction—were so complex and interrelated that the engineers decided to do the whole job. Stresses and bouyancy were computed for 26 separate and consecutive stages of construction for Pier 1S, and similar studies were made for the other piers. Much of this information was made available to the bidders.

• **Big caissons**—Fabricated by the Newport News Shipbuilding and Drydock Co. the caissons were towed 60 miles through Hampton Roads, Chesapeake Bay and the York River to the site. Two of them—for the swing span pivot piers—are 52 x 66 ft in plan (Fig. 3) and were 110 and 101 ft high as towed. Sunk in 70 and 80 ft of water respectively, their cutting edges will come to rest 141 and 150 ft below mean tide level. The other four caissons are similar though slightly smaller in plan size—42 x 66 ft. Two of them go as deep as the larger caissons, and two are founded at El—135.

The caissons are all-welded steel boxes made of a ¾-in. continuous skin plate reinforced by steel wales 3 ft on centers, soldier beams and struts. The two largest have six 12-ft dia dredging wells, while those in the others are 9½ ft in diameter. Jet pipes—3 in.

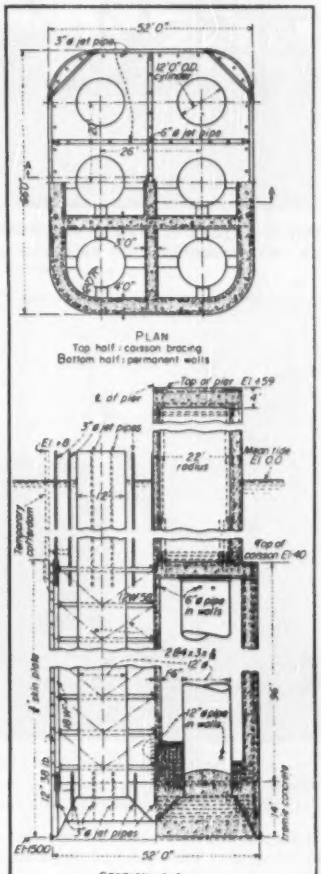


FIG. 3. CAISSON and pier details reveal the substantial nature of the swing span foundations. Other piers are similar.

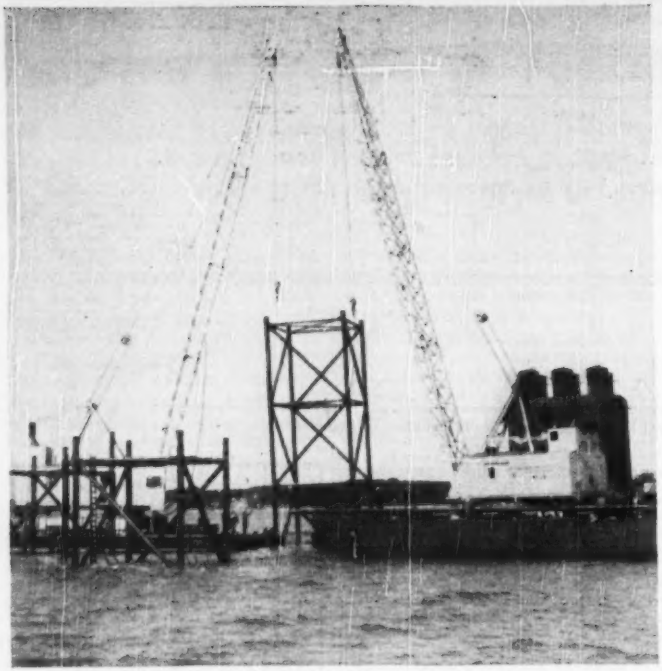


FIG. 4. A 112-FT TOWER of welded steel pipe is lowered to bottom of York River as part of the framed dock into which a pier caisson will be floated and sunk.

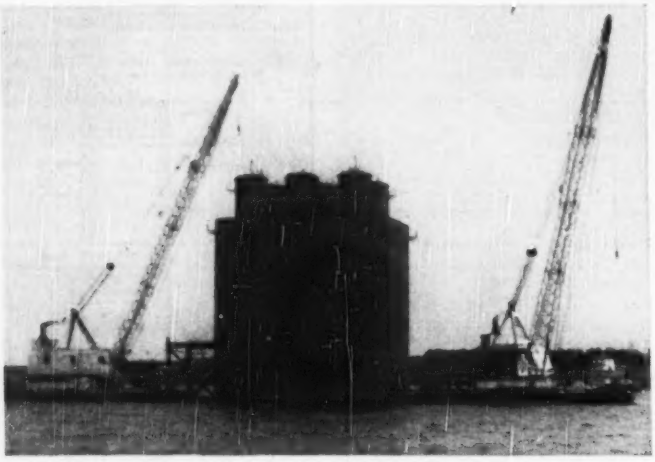


FIG. 5. CAISSON 110 FT HIGH and drawing 33 ft is floated into its dock ready for sinking. A steel-pipe tower similar to those already set will be installed against the downstream face to complete the dock enclosure.

in dia and 5 ft on centers—are installed in all walls. Two 6-in. jet pipes are placed at the intersections of the walls near the center of the caisson; these wall intersections also serve as columns to support the interior bracing. All walls are reinforced with ¾-in. rods on 12 in centers both ways, except for 1 in. horizontal rods that are installed in the exterior walls.

• **Design for Sinking**—Until a caisson penetrates the river bottom, it is sunk by pouring successive lifts of the concrete walls. This operation must be carefully controlled and the height of each lift computed in order that those portions of the skin which have not yet been reinforced by seasoned concrete will not be overstressed as a result of excessive draft and the resulting water pressure on the outside. The skin plate and the walls were designed for a maximum head of 23 ft.

Were the interior and exterior walls to be poured simultaneously throughout, this draft would be exceeded. Hence, after the lower 20 ft of concrete is in place, the exterior walls are advanced as much as 20 ft above the interior walls, which are keyed and doweled to the exterior walls to compensate for the lack of monolithic construction. This lag in the pouring of the interior walls subjects the struts and soldier beams to hydrostatic heads up to 20 ft greater than that for which the skin was designed.

The engineers did not specify the use of caps and air pressure in the dredge wells to increase bouyancy and, as a consequence, wall lifts were limited to 5 ft. The contractors, however, elected to use this method of obtaining greater bouyancy thus permitting 9 ft increments, which has speeded up the construction.

Although light-weight hollow construction is a necessary feature of the completed pier—as well as during the bouyant stages of the construction—it is something of a handicap during the final stages of sinking since it limits the available weight for overcoming friction and displacing the soil beneath the cutting edge. The engineers, therefore, contemplated that water would be added to the spaces surrounding the dredge wells when additional weight was needed. Experience in sinking the first of the caissons has indicated that such added weight is desirable during initial excavation, but that in the later stages a more effective procedure is to pump down the water in the dredge wells thus reducing the effect of bouyancy.

• **Novel caisson "docks"**—To lower these caissons in the deep water and swift tides of the York River required anchoring and sinking control of unquestioned certainty. The contractors met this challenge by designing a unique "dock" of welded steel pipe framework into which the caissons could be floated and sunk. So successful have these docks proved, both in holding the caissons in position and in guiding their sinking, that the first three foundations have gone down with remarkable ease. Three sets of dock framing were provided, each planned for use with two caissons.

Basic element of the framing (Fig. 4) is a prefabricated tower 112 ft high, which is lowered onto the river bottom

and held in place by pipe piles inserted in the tower legs and driven to 30 to 40 ft penetration. Four of these towers are required for each dock, one set against each face of the caisson. Yokes join the four towers, bracing them into an integrated framework that completely surrounds the caisson (Fig. 6). Three sides of this framework were completed initially. The caisson was then floated in, and the fourth tower and connecting yokes installed.

The towers are fabricated entirely of steel pipe connected at the panel points by special gusset plate details (Fig. 7) made to a design patented by John Newell, chief engineer of Massman. The gusset plates are flame cut to fit the curve of the tower leg and are inserted into slots cut into the diagonal and strut pipes. The entire construction is welded.

The tower legs are 14 in dia pipe with a 13¾ in. I.D., which provides a close fit for the pipe piles whose outside diameter is 12¾ in. These pipe piles are about 150 ft long.

Details of the corner yokes are shown (Fig. 6). They consist of three principal members. The main one joins the outside legs of two adjacent towers and is pinned at its center point to two knee-brace members set at right angles to one another and connected to the inner legs of the towers. The main member is adjustable from both ends in 3 in. increments, and shims can be inserted in the detail to give even closer adjustment.

The towers weigh 37 tons each. They were brought to the job on barges, upended and lowered to the bottom by two barge-mounted revolving cranes with 125 ft booms.

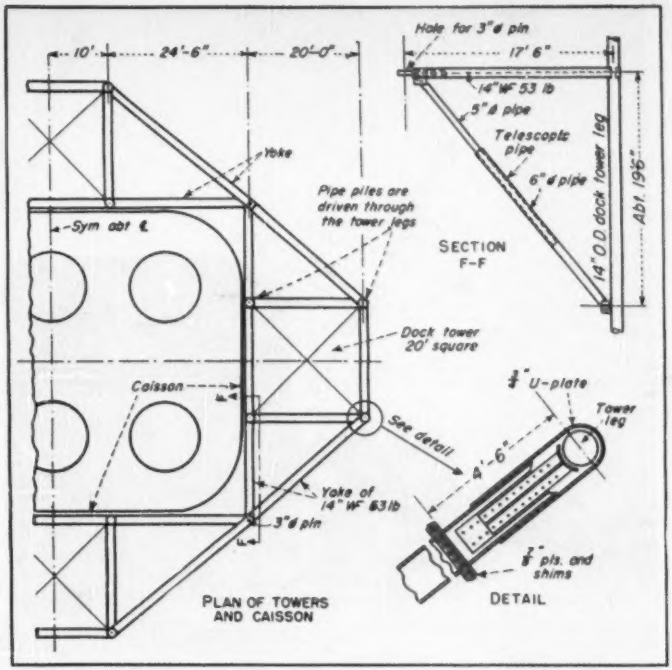


FIG. 6. HOW SPECIAL DOCK FRAMING was used to enclose the caissons and serve as a guide for their sinking. Long pipe piles were driven through the legs of the pipe-framed towers to anchor them to the bottom.

• **Concrete supplied from shore**—The method adopted for supplying the concrete for the river piers is as much a departure from precedent as are the pipe-framed caisson docks. Most often floating mixing plants are used for this purpose, but at Yorktown the concrete was mixed ashore and brought to the piers in buckets. Although five consecutive handlings are required, the time from batcher to forms has averaged less than 20 minutes.

Operations begin at a materials batching plant on the Yorktown shore. Owned and operated by a local company, but built especially for the bridge job, the plant is set against a hillside only about 100 yd from the river. The aggregates and cement, obtained at a railhead about 8 miles away, are loaded into the top of the bins which are flush with the top of the hill. They are batched into three 4½-yd truck mixers which shuttle back and forth the 100 yd to a ramped dock built out over the river. Here, the trucks, after giving the concrete a 6 min mix, discharge it into a 10 yd hopper.

The concrete is now ready for its over-water journey. Barges, each carrying four 2-yd concrete buckets, are put in under the hopper, loaded and towed out to the sites of caisson sinking operations. Here, a floating crane lifts the buckets directly into the caisson, and lowers them down a special guide cage into a 3-yd hopper set on a working platform. From this point the concrete is buggied to the point of deposit in the caisson walls. From the buggies the concrete goes into another hopper and down elephant trunks to place. Maximum drop is about 35 ft.

When concreting begins, the bottoms of the caissons are about 33 ft under water, the draft under which they had been towed in and which had been supplied by about 1500 tons of concrete that had been placed at the shipyard. Concreting is done in successive, predetermined lifts, while the caissons float and until the cutting edge penetrates about 10 ft into the bottom. During this time the dredge wells are capped and fed compressed air to increase the buoyancy of the caissons.

Once the caisson has penetrated the river bottom to a depth sufficient for support, the air is cut off and the dredge well cap removed. Experience so far is that the caisson drops about 3 ft under its own weight when this is done. Dredging is then begun and continued until the caisson has a freeboard of about 10 ft. At this point work is halted until the dredge wells

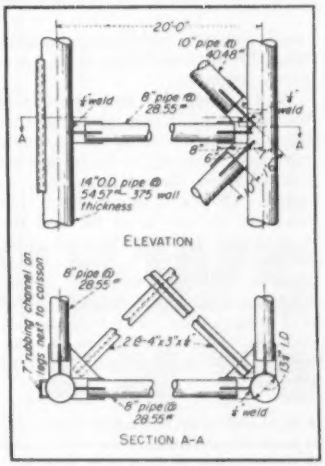


FIG. 7. PIPE TOWERS were fabricated by welding, using an ingenious gusset plate detail at the joints.

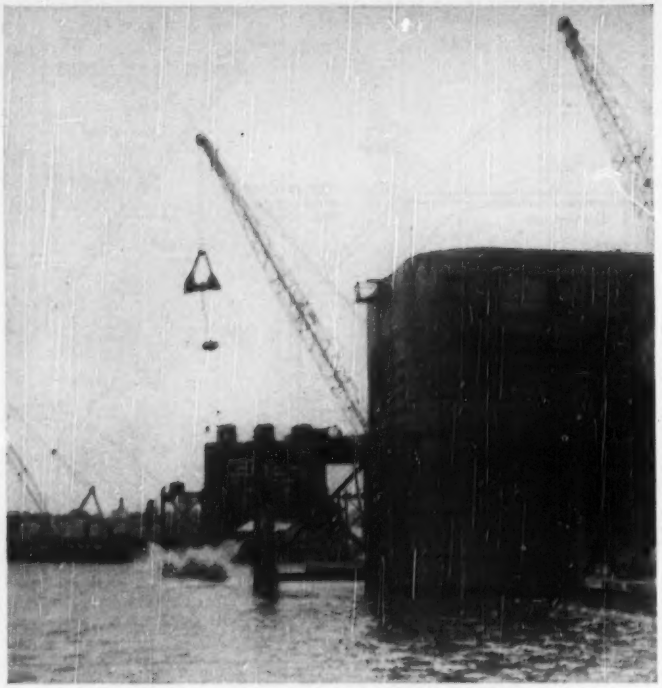


FIG. 8. TEMPORARY STEEL COFFERDAM, added to increase height of the caissons, utilized a special "sag plate" design to increase skin strength. Dredging is being carried out by two clamshell cranes.

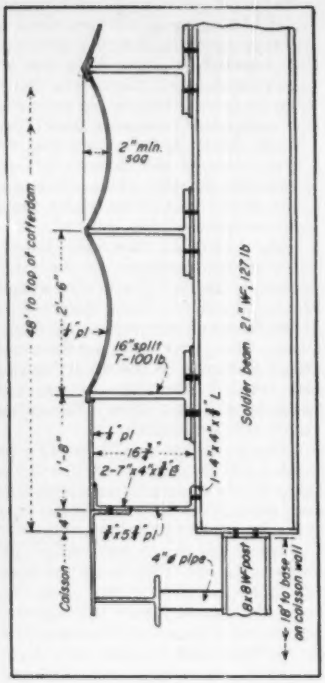


FIG. 9. COFFERDAM WALL details and connection to caisson. Note 4 in. pipe transferring wind load to bracing.

can be extended and the caisson walls raised by the installation of the temporary cofferdam.

As a measure of the magnitude of the concreting it may be noted that there was 8500 tons of concrete (about 4300 cu yd) in the caisson for pier 15 when the cofferdam was installed. Of this, 3134 tons was placed after the air was taken off, and the cutting edge 7 ft into the mud. After sinking to the 10 ft freeboard—which for this caisson meant 22 ft into the mud—there remained about 35 ft of wall to be poured. This weight, plus, dredging, was counted on to sink the cutting edge the remaining 50 ft to El-150.

• **Steel cofferdam extension**—Since the tops of all of the caissons will be 40 ft under water in final sunk position, their heights must be extended by cofferdams as sinking progresses. Although it had originally been contemplated that these cofferdams would be of conventional timber-braced steel sheetpiling, the contractors decided to play it safe and use a stiffened steel plate dam. Again they came up with an original design in which extra strength is accorded the four walls by fabricating them of dished or sag plates (Figs. 8 and 9). The plates, welded together, are hung between horizontal wales made of split 16-in 100-lb H-sections spaced 2½ ft apart. Because of the strength of this construction, vertical soldier beam supports are required only at the ends of these sag plates, i.e., 24 ft apart on the sides of the cofferdam and 10 ft apart on the ends. Smooth plates are used at the corners since it was not practicable to dish them.

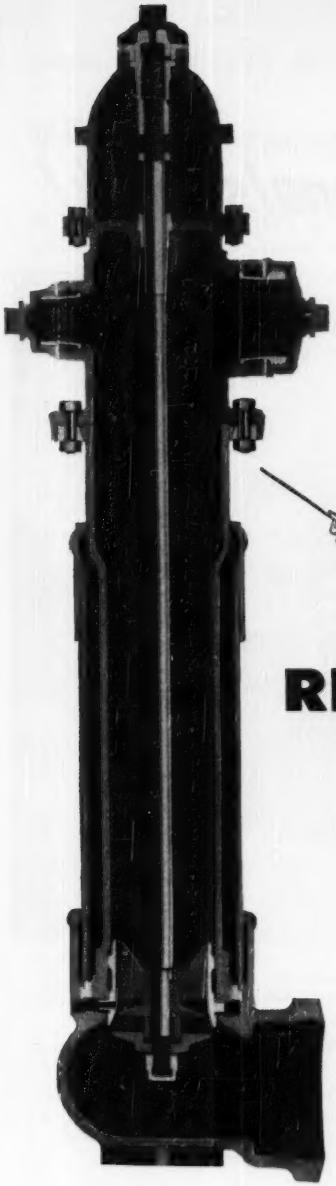
The cofferdam, which is 48 ft high, contains four levels of horizontal steel bracing supported near the center by two lines of steel columns. There is also a system of diagonal tierods, and the corners are individually braced with cross struts.

Installation of a cofferdam is the signal for continuous dredging to begin. Two floating rigs with 125-ft booms and 2-yd clamshell buckets do the work, wasting the material beside the piers. To insure against any tendency for the caissons to tip, dredging in the center wells is kept about 3 ft ahead of that in the outside wells. Initially some support against tipping is furnished by the steel-pipe towers of the anchoring dock, but these are removed as soon as the cutting edge enters firm material in order that the towers may be used at another pier.

Concreting is continued as required for sinking as the dredging proceeds. When the cutting edge reaches final elevation, a 14 ft tremie seal is made in the dredge wells to which 3 ft of concrete is added after the wells are pumped out.

As a final operation the dredge well extensions in the cofferdam are removed and a load distributing slab poured at the top of the caisson. The piers are built on this slab (to 100 ft maximum height above the top of the caisson), and the temporary cofferdam removed.

• **Personnel**—The Yorktown Bridge foundation contract is being directed by George Adgate, project manager, for the joint contractors Massman Construction Co. and Kansas City Bridge Co., both of Kansas City, Mo., with John Kuhn field superintendent and Thomas Kinter, field engineer. For Parsons, Brinckerhoff, Hall & Macdonald, Maurice N. Quade is partner in charge, George Vaccare designed the substructure and Roger Stevenson resident engineer. C. S. Mullen is chief engineer and William R. Glidden bridge engineer of the Virginia State Highway Department.



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COOL CONCRETE AT DETROIT DAM—PART I

Why low-temperature concrete was specified

EDITOR'S NOTE: This article, by two of the men responsible for design, tells why stringent and unusual concrete temperature controls are prescribed. Authors are R. R. Clark and Harlan E. Brown, respectively: Head, design branch, and Head, structural design section, for the Portland District, Corps of Engineers. A subsequent staff-written article will detail contractors' problems in meeting the specifications

TEMPERATURE OF THE CONCRETE as it goes into Detroit Dam is limited to a maximum of 50 F. That is believed to be the lowest maximum in any major dam structure constructed to date except Philpott Dam in Virginia, where the same temperature is being attained.

This placing limitation is aimed at reducing concrete temperature rise, which in turn restricts the difference between maximum temperature during curing and ultimate temperature of the structure. Because the mean annual air temperature at Detroit Dam —and thus the ultimate temperature of the dam—is lower than at most dam sites, the concrete placing limitation must be proportionately lower.

Such control of concrete temperature rise makes unnecessary some of the grouting and contraction joints as well as a large part of the embedded pipe-cooling system that otherwise would be required.

Basic in the design of a gravity dam is the assumption of monolithic action of the cross-section in resisting the water pressure against the upstream side. When grouted contraction joints and shear keys are used in planes parallel to the axis this assumed monolithic action is to some degree destroyed. Major cracking of the concrete also reduces the monolithic action of the cross-section. If such cracking can be prevented by control of the concrete temperature rise, a cross-section without joints parallel to the axis is possible. Such a cross-section is preferred from a design standpoint to one with grouted joints and shear keys. Also, the cost of temperature control provisions can be more than offset by the elimination of the contraction joint grouting and reduction in the amount of forms and embedded cooling pipes.

Accordingly, no contraction joints parallel to the axis are to be permitted in Detroit Dam. Thus, the plan area of some concrete blocks in the dam will be as much as 50x330 ft (maximum width at the base is 330 ft). Had contraction joints been included, the joints would have to be pressure grouted to insure monolithic action of the cross-section assumed in the design. This would have to be done before the water surface could be raised behind the dam. But as the heat generated by cement hydration is dissipated very slowly from a large mass such as Detroit Dam, it would be many years before a satisfactory grouting job could be done—unless, of course, practically all of the mass concrete is completely cooled with an embedded-pipe, cooling system.

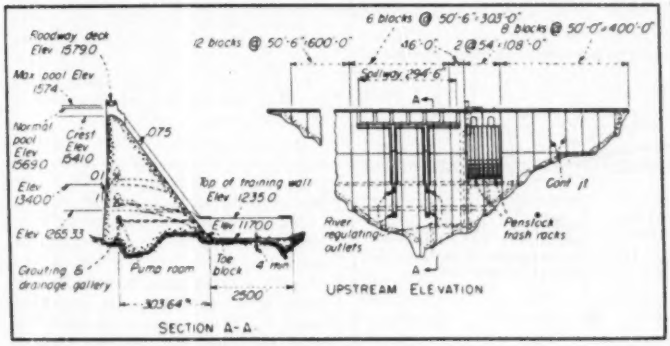


FIG. 1. DETROIT DAM is to have no longitudinal construction joints, which means that shrinkage due to cooling must be kept low by placing concrete at unusually low temperatures.

• **Design facts**—These facts are pertinent to the Detroit Dam design problem:

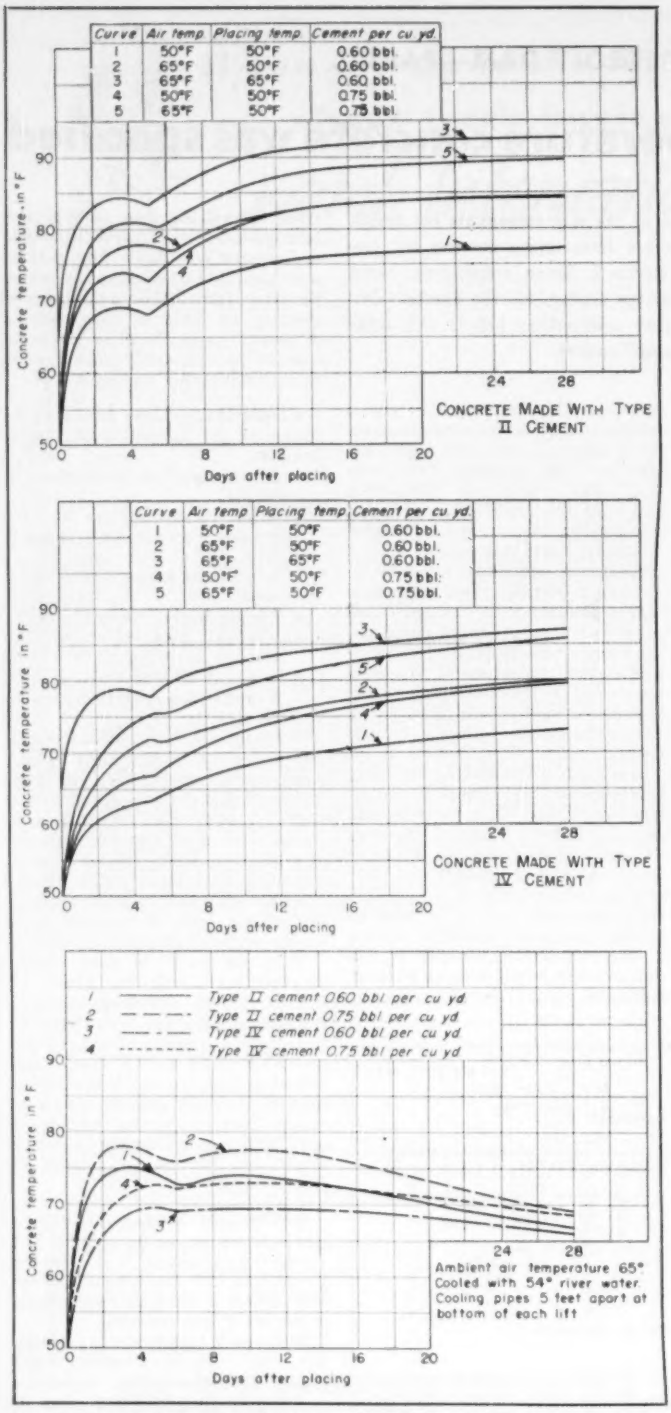
1. Mean annual air temperature is 49.1 F.
2. Mean air temperature for two maximum months (July, August) is 65 F.
3. River water temperature is 56 F or less.
4. Specific heat of concrete is 0.21.
5. Thermal diffusivity of concrete is 0.032 ft² per hour.
6. Type of cement used will be Type IV (low heat) and Type II (modified).

With these facts in mind, the first design step was to determine the decrease in temperature that might be withstood without producing serious structural cracks. For this purpose two studies were made: One was a review of the experience at other dams constructed without joints parallel to the axis; the other was a consideration of extensibility tests of concrete made for the design of Bonneville Dam.

With the results of these studies on hand and with the advice of R. W. Carlson, consulting engineer, it was decided that the 28-day temperature of mass concrete should not exceed 80 F. This is 30 F above mean annual air temperature. It is expected that the dam will gradually cool that much. However, gradual cooling of only 30 F is not expected to induce cracks; but any greater amount of cooling might.

• **Why only 28 days**—To explain why temperature rise for only the first 28 days is significant, it is necessary to consider the time-temperature relationship and the plastic and elastic properties of lean concrete.

At the rock foundation of a gravity dam, the concrete is almost completely restrained against expansion occurring as result of the heat of hydration. No tension would be induced and thus there would be no


Curve | Air temp | Placing temp | Cement per cu yd
1 | 50°F | 50°F | 0.60 bbl.
2 | 65°F | 50°F | 0.60 bbl.
3 | 65°F | 65°F | 0.60 bbl.
4 | 50°F | 50°F | 0.75 bbl.
5 | 65°F | 50°F | 0.75 bbl.
Concrete temperature, in °F
Days after placing
CONCRETE MADE WITH TYPE II CEMENT
CONCRETE MADE WITH TYPE IV CEMENT
1 Type II cement 0.60 bbl. per cu yd
2 Type II cement 0.75 bbl. per cu yd
3 Type IV cement 0.60 bbl. per cu yd
4 Type IV cement 0.75 bbl. per cu yd
Ambient air temperature 65°
Cooled with 54° river water.
Cooling pipes 5 feet apart at bottom of each lift

FIGS. 2-4. COMPUTED CONCRETE TEMPERATURES for conditions anticipated at Detroit Dam when concrete is placed in 5-ft lifts with 5 days between lifts.

tendency to crack if the properties of the concrete did not change and the temperatures were never to go below the placing temperature. But concrete is very plastic at early ages when temperature is rising. It is reasonably elastic at later ages when temperature is falling.

Thus, the temperature rise that occurs at early ages develops little or no compressive stress. On the other hand, the subsequent temperature drop develops tensile stress in accordance with the degree of restraint, modulus of elasticity and tendency to contract.

At later ages, the degree of restraint, modulus of elasticity and tendency to change in length are nearly identical, whether for heating or for cooling. Thus, the small temperature rise that occurs at later ages develops compressive stresses that are almost exactly relieved by an equal later temperature drop. For these reasons it is convenient to disregard the temperature rise occurring after about one month as not contributing to the tendency to crack.

Tests made on concrete for Bonneville Dam substantiate this view. In that case large cylinders of concrete were restrained against change in length while subjected to a rise or fall of temperature.

A much more complete study of temperature stresses might show that only some shorter time than four weeks need be considered. In such case, control of the concrete temperature would be somewhat easier. Analyses are hampered considerably due to lack of pertinent test data, particularly on lean concretes such as are used in dam construction.

• **How temperature limit is determined**—Probable time-temperature rise in mass concrete for many different conditions was computed as a first step in setting a limit on the concrete temperature. The variables considered were air temperature, placing temperature, thickness of lifts, time intervals between lifts, cement content and type of cement. Figs. 2 and 3 show the computed time-temperature curves for those conditions most important in this discussion.

An examination of Figs. 2 and 3 will show that a maximum mass concrete 28-day temperature of 80 F can be obtained when low heat cement (Type IV) is used if the placing temperature is limited to 50 F and the cement is limited to 0.6 bbl per cu yd with a mean daily temperature of above 65 F (summer). On the other hand, if Type II cement is used this same maximum can be met only if mean daily air temperature is not more than a few degrees above 50 F.

However, these curves are only esti-

mates of the probable temperature rise. They are based on assumptions as to the heat of hydration of the cement and the thermal properties of the concrete. Besides this, the effect of air temperatures above the mean are assumed to be balanced by air temperatures below the mean.

With all these factors in mind it was determined to limit the placing temperature to 50 F and use 0.6 bbl of cement per cubic yard of concrete. The final temperature of the concrete can then be restricted to below 80 F by using Type IV cement during warm weather and the less expensive Type II cement during other seasons of the year.

• How temperature limits are met—The designer has available a number of methods of controlling the temperature rise of mass concrete in a large dam. First are those requirements that have in recent years become standard procedure. These are: Limiting the maximum thickness of lifts to 5 ft, a minimum time interval between lifts of something in the neighborhood of five days, and the use of the lowest practicable cement content.

These standard procedures are of significant benefit. However, Fig. 2 shows that they are not sufficient to meet the design requirement for Detroit Dam that limits 28-day temperature of the concrete to 80 F.

Additional control of the temperature rise can be obtained by the use of low-heat cement, cooling materials before mixing to lower the placing temperature, and by use of embedded cooling pipes.

On Detroit Dam all three of these special temperature control measures are to be used. The low-heat cement use has previously been described. If this is not enough, cooling the complete mix is the next most practicable operation.

Mix cooling can be done by substituting ice for a portion of the mixing water or by cooling the materials before they go into the mixer. A number of recent projects have required ice in the mixing water. However, the amount of cooling possible is restricted by the fact that the amount of ice is limited to about 85% of the added mixing water. Thus for each yard of concrete only about 100 lb of ice can be added. This amount is not enough cooling during the summer months.

To meet the Detroit Dam temperature restriction the contractor is cooling coarse aggregate by inundation and cooling sand and cement by a heat exchanger type arrangement. Mixing water will also be cooled before it is added to aggregates.

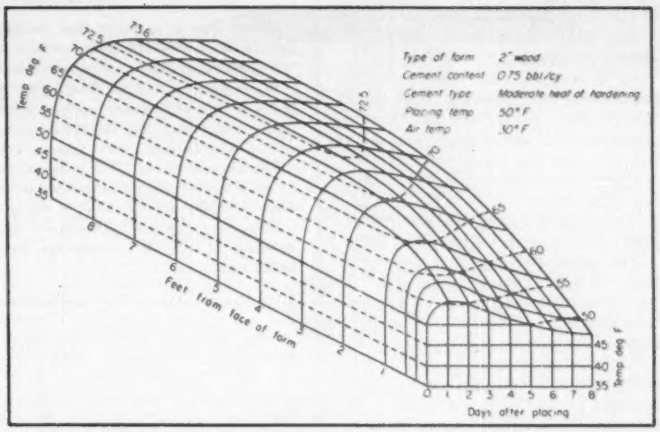

Type of form 2" wood
Cement content 0.75 bbl/cy
Cement type Moderate heat of hardening
Placing temp 50° F
Air temp 30° F
Temp deg F
Feet from face of form
Days after placing

FIG. 5. TEMPERATURE VARIATIONS in mass concrete with respect to time and distance from the face of 2-in. wood forms. This chart was used in a study of the effect of stripping forms in cold weather.

• Cooling pipe too—Embedded cooling pipes also are to be used to control temperature rise in some of the Detroit Dam concrete. Cooling involving circulation of water with a maximum temperature of 38 F (known as Type A cooling) is used in restricted areas that are really part of the dam foundation. Cooling involving run-of-the-river water (Type B) is to be used where the base width exceeds 250 ft. On the abutments, Type B cooling is to be used from the base to the plane where foundation restraint is estimated to be reduced by 50%.

The low parts of the dam that require Type A cooling include the deeply cut channel at the base of blocks 19 and 20. This form of cooling also is to be used for the toe blocks that extend from the dam to the stiling basin slab below the base of blocks 15, 16, 17, 18, and 21. In both of these instances the concrete is really part of the foundation. The objective is to get this concrete to the same temperature as the adjacent rock before it is covered by additional concrete.

The purpose of Type B cooling as it is to be used at Detroit is not to completely cool the concrete but to reduce the maximum 28-day temperature rise by about 5 deg. By this means, sufficient heat will be removed so that the computed temperature at the age of one year will not exceed the early peak temperature that occurs several days after the concrete is placed.

To accomplish this, computations indicate that the water must be circulated 30 to 40 days depending on air and water temperatures at the time. Typical temperature rise curves for concrete cooled with Type B system is shown on Fig. 4.

• Effect of low lifts—A further investigation was made of the 28-day concrete temperature for 2½-ft and for 5-ft lifts. Computations for placing temperature of 50 F, with mean air temperatures at 65 F and 50 F and with 0.75 bbl of Type IV cement per cubic yard indicate that:

(a) When air temperature is 65 F, the mean 28-day temperature of the first 10 ft of concrete is practically the same for 5-ft and 2½-ft lifts.

(b) When the air temperature is

CONCRETE PLACING TEMPERATURES ON RECENT LARGE DAMS

Dam	Maximum placing temp.	Mean air temp.	Methods used to cool concrete
Davis	80 F	100 F (summer)	Ice for mixing water
Clark Hill	70 F	64.8 F	Concrete not cooled
Bull Shoals	65 F	59.1 F	Coarse aggregate precooled
Fort Gibson	50-65 F	62.0 F	Ice for mixing water
Detroit	50 F	49.1 F	All materials precooled
Philpott	50 F		Ice in cool mixing water and air-cooled aggregates

50 F, the mean 28-day temperature of the first 10 ft of concrete is nearly 5 deg lower if placed in 2½-ft lifts instead of 5-ft lifts.

It is evident that when placing temperature in appreciably lower than that of the surrounding air, concrete placed in 2½-ft lifts absorbs heat from the air and the usual reduction in concrete temperatures is not obtained. For this reason 2½-ft lifts are not to be required during the months of June, July, August, and September.

The remainder of the year a minimum of four 2½-ft lifts on rock or on concrete more than 15 days old is stipulated. Where a foundation slope is steep and the area of a block is not covered by four 2½-ft lifts, the contractor will be required to place concrete in 2½-ft lifts until 90% of the area of the block foundation is covered.

• **Cold weather cracks**—The most severe temperature changes occur during winter months when air temperature is low and the concrete has been placed at controlled temperatures or the materials have been heated to prevent freezing. A study of this was also made. Fig. 5 is an isometric projection of the variation of temperature on the face of a wooden form with time and distance. It can be seen that at 2-day age the temperature of the concrete surface under the forms is 55 F and at the age of 8 days it is 48 F.

When the forms are removed the surface of the concrete in cold weather will be required to withstand an immediate drop to air temperature. If the air temperature is 34 F (the daily average for January) this temperature drop will be 21 deg at 2-day age and 14 deg at 8-day age (additional cooling will take place during cold nights). These quick temperature drops are about the maximum that concrete can stand without cracking.

With other worse cases certain to occur, a considerable portion of the concrete placed in winter months may have surface cracks if wooden forms are removed at the age of 2 or 3 days. Accordingly, non-insulating forms (steel forms with no wood sheeting) are used for contraction joints between blocks. Thus, the temperature of the concrete immediately under the forms will be close to air temperature. Therefore, there will be no thermal shock to the concrete when the forms are removed.

During freezing weather, freshly placed concrete will be protected against freezing by tarps hung on the forms or by other means that will guarantee retention of sufficient heat until the concrete has set.

Construction of Detroit Dam is under the direction of the Portland District, Corps of Engineers, with Col. D. S. Burns, district engineer. Resident engineer is C. C. Davis, assistant resident engineer is S. R. Overholser and C. W. Beck is chief of operations.

The general contract is held by Consolidated Builders, Inc., a joint venture made up of Kaiser Engineers, Inc.; General Construction Co.; Walsh Construction Co.; Bates and Rogers Construction Co.; The Shea Company; Pacific Bridge Co.; and Utah Construction Co.

FACTS ABOUT DETROIT DAM

Detroit Dam is a gravity-type, multiple-purpose structure located on the North Santiam River some 100 miles southeast of Portland, Ore. It is a major unit of the Willamette River flood control system being built by the Corps of Engineers.

Water stored during the flood season will be released during the summer and fall in the interest of irrigation, navigation, pollution abatement, fish life, domestic water supply, and power. The 100,000-kw power plant will be used for peak loads in connection with Columbia River power plants.

The dam will extend 371 ft in height above normal tailwater (maximum height foundation to deck is 463 ft). Maximum base width is 330 ft and total length is 1,580 ft. About 1,500,000 cu yd of concrete will be required. The contract price is $28,230,509.

Storage capacity is 455,000 acre-ft. The overflow spillway is designed for maximum discharge of 176,000 cfs (average flow is 1,764 cfs and maximum recorded is 60,000 cfs).

British try landfill for refuse disposal

Experiments to help solve the problem of refuse disposal as well as to reclaim derelict land for useful purposes are being carried out in England. The work is being done by the Chemical Research Laboratory of the Department of Scientific and Industrial Research and local authorities.

Incineration has been found to be expensive. And even after incineration about 40 percent of the total volume remains for disposal.

Many areas of the country are studded with large gravel pits and quarries, now exhausted, most of them filled with water. It is thought that if rubbish could be dumped into these, not only would a new and cheap method of refuse disposal be available but also reclaimed land could be used for housing or agriculture.

• **Foul gas**—The disadvantage of this method is that indiscriminate dumping may cause growth of living organisms known as sulfate-reducing bacteria, which transform sulfates in contaminated water to hydrogen sulfide, an offensive gas.

Sulfate-reducing bacteria exist in most all soils and waters. They do not begin to grow until suitable organic matter is fed to them. When rubbish with putrescent material is dumped into a wet pit, sulfate reducers may grow rapidly and produce large quantities of this foul smelling gas. Pits contaminated in this way are a nuisance to people living nearby. Cases have been reported to the Chemical Research Laboratory in which the paint of nearby houses has been blackended both inside and out as a result of the aggressive gas.

• **It's being tried**—The experiments in progress are being carried out by the CRL in collaboration with the Twickenham (Middlesex) Borough Corporation. A new refuse disposal works is being built in the center of a ring of mud gravel pits. And obviously it would be desirable if clinkers—from incinerators and the fine refuse which is not burned—could be dumped there.

Both materials, clinkers and fine refuse, have been tested in the laboratory. The clinkers produced no hydrogen sulfide even after long incubation in water. Fine refuse in water begin to evolve the gas after only 24 hours.

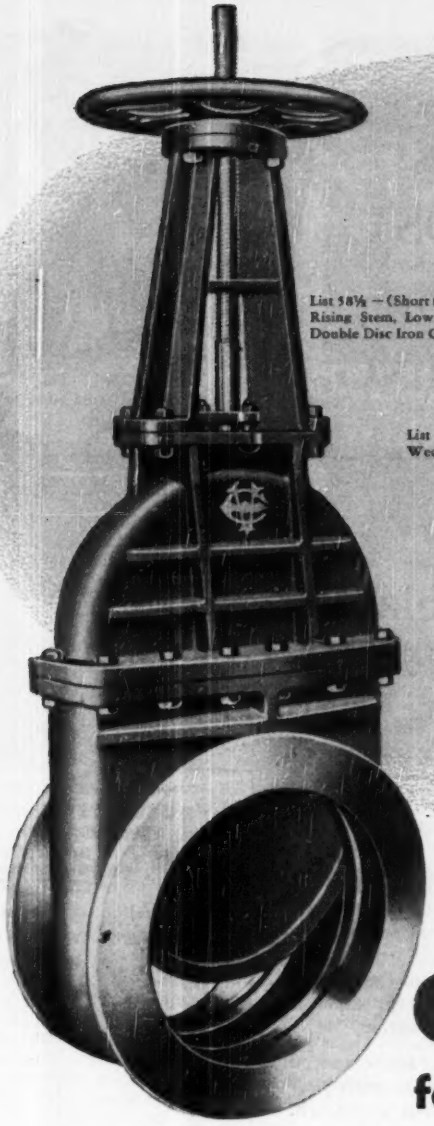
The borough engineer has suggested dividing one of the pits, containing about 120 mg of water, into lagoons holding about 1 mg. Walls of the lagoons would be of inert clinker.

Fine putrescent refuse would then be dumped into the smaller lagoons so that they could be completely filled before any nuisance develops. If the sulphur gas should develop it is believed that it could be cured by adding acid to prevent bacteria.

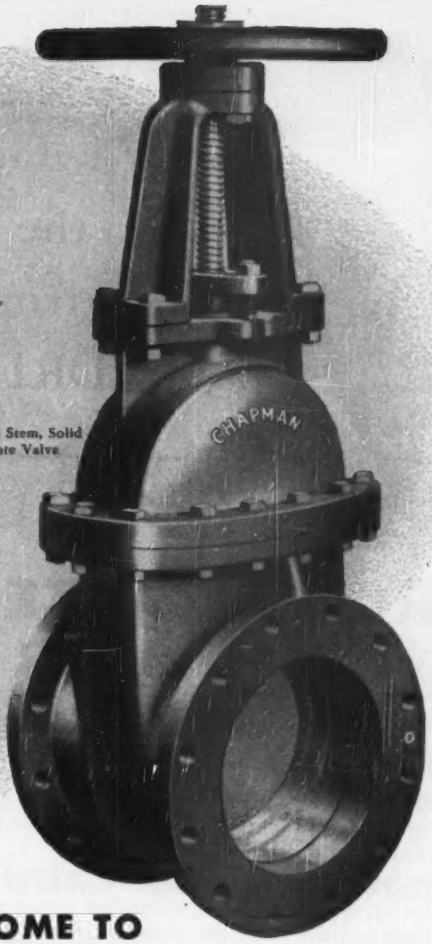
An experimental lagoon has been built to test the method practically. Dumping of fine refuse into it has begun and early results are encouraging.

After experiments with fine refuse have been completed, it is proposed to dump the crude household refuse direct into the lagoons. This would avoid trouble and expense of incineration.

It is probable that the ideal solution to the problem would be to use another micro-organism that consumes hydrogen sulfide as fast as sulfate-reducing bacteria produce it. There are several types of bacteria which consume this form of hydrogen.



List 58½ — (Short face to face), Rising Stem, Low Pressure, Double Disc Iron Gate Valve



List 25 — Rising Stem, Solid Wedge, Iron Gate Valve

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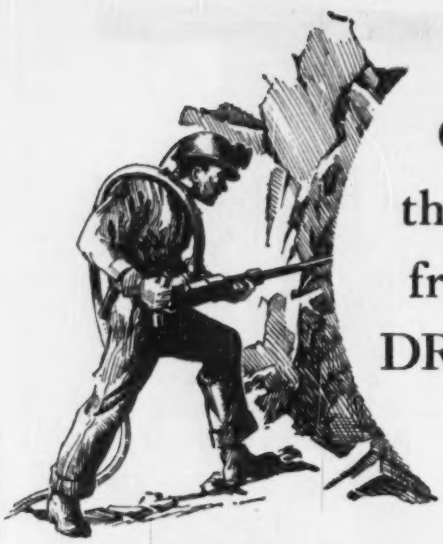

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The ROCKMASTER system is based on split-second time intervals between blast holes, the timing being controlled within the electric detonators. You have a choice of 16 time intervals, which we help you select to fit your requirements. Explosives are chosen and loaded to fit the ROCKMASTER plan. The result: Explosives gases work behind the burden longer, stepping up blasting efficiency and accomplishing far superior breakage, combined with almost unbelievable control of throw.

In terms of drilling, this usually means that drill holes can be spaced farther apart. Or, it might mean you can use less dynamite with your regular spacing. Drilling for secondary blasting is usually cut way down, frequently eliminated altogether.

Write for booklet showing typical ROCKMASTER loading patterns for various types of blasting work. Or, better yet, call in the Atlas representative and let him tell you frankly what ROCKMASTER blasting can do for you.

ROCKMASTER TIMINGS

Rockmaster No.	Avg. Time of Each Delay from Zero (milli-seconds)
0 (zero)	0 (inst.)
1	8
2	25
3	50
4	75
5	100
6	125
7	150
8	175
9	200
10	250
11	300
12	350
13	400
14	450
15	500
16	550

ROCKMASTER: Reg. U. S. Pat. Off.

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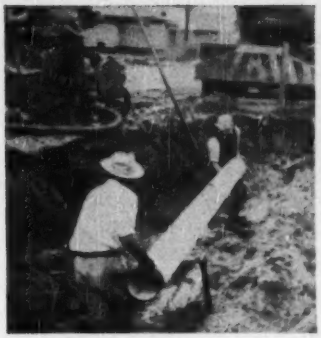
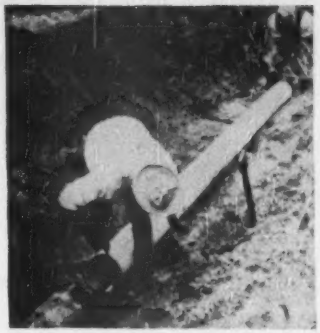
CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

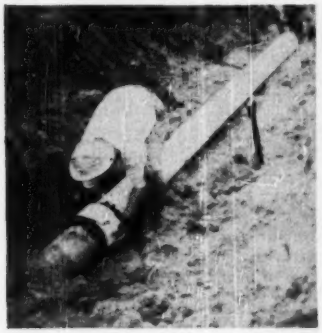
1. LIGHT-WEIGHT, 13-ft asbestos-cement pipes lower easily in deep trenches.



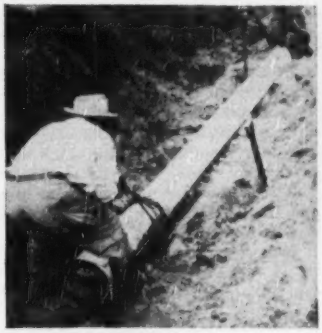
2. THEY'RE HANDLED by two men—with no strain—in shallow cuts.



3. PIPE ENDS are coated with cut-back asphalt primer.



4. JOINTS are made with an AC collar, its asphalt lining softened with primer.



5. A RATCHET-OPERATED puller rams taper-end pipes home in the collar.

6. PIPES are bedded in wet sand, tamped in and around the barrel.

Longer pipes + fewer joints = better sewers

SEWER CONTRACTORS rightly dread a high water-level in the ground.

It means headaches and extra effort: They must draw sand-laden pump-wearing water continually out of the trenches. They have to guard against treacherous cave-ins. They must fight to get tight joints under the most disagreeable conditions. They must be constantly alert to keep pipes at line and grade. Sometimes they're called upon to put down concrete cradles for pipe in soggy, weeping soil. And they must take unusual pains to backfill without breakage or displacement of pipe.

When it comes to laying sewers, Freeport, N. Y. has some of the worst soil-water conditions. In one vast seaside section, street grades are but a few feet above high tides. Storm-borne tides, in fact, creep up into the streets. Rain water runs off slowly. Water-soaked underlying soil is black rubbery clay-sand or clay. Upper layers flow readily but lower strata stand unsupported for a day or two.

• **New houses, new sewers**—Speculative builders have moved in on this low tidal area; they're developing properties right and left. (The village establishes first-floor minimum elevations well-above high tide). This meant that sewers had to be built without delay to forestall a sanitary mess.

Plans for putting down 29,900 lf of 8-in. sewer in District 13 (there are other districts in the area) were designed by Herbert M. Wood, village engineer. On the basis of previous experience, he called for asbestos-cement pipe. He based his decision on these facts and observations:

1. Earlier bids with vitrified-clay and AC-pipe alternates were equal.

2. AC sewers can be laid at 0.25% gradient instead of at 0.40% specified by the State Department of Health for VC pipe. Kutter's coefficient for AC pipe is 0.011. This goes with a minimum velocity of 2 fps.

3. The lower gradient meant less excavation (and fewer very deep cuts) and lower pumping costs (sewage is air-lifted from low-lying sections to gravity outfalls).

4. Longer lengths (13 ft) with fewer joints reduces infiltration. This means a lighter load on the treatment plant.

5. Light-weight longer pipes are easy to handle, and make a straighter, more uniform finished gradient. The latter is checked by mirrors and flashlights.

6. AC pipes can be put down without concrete cradle. They can be firmly bedded and tamped-in-place so that movement is prevented.

• **Putting it down**—Trenches are cut with a backhoe or clamshell. In wet trench the usual cut is just a little longer than one-pipe length and to about 4 in. above subgrade. Trench bottom is excavated to subgrade by hand.

Pipes are handled by two men who use ropes for lowering into deep

7. LATERALS to houses take off the sewer through 5-in. cast-iron cut-in fittings.

8. MANHOLE: Circular concrete blocks form the barrel. Corbled blocks make . . .

9. THE TRANSITION from the barrel to the cover frame.

trenches. One section of 8-in. pipe—13 ft long—with sleeve joint—weighs about 170 lb.

A pipe to be laid is first positioned roughly—centered and brought a little above grade at the upper end. Its lower-end joint, the end of the in-place pipe and inside of the AC collar are painted with bitumen primer. The collar is then slipped on the in-place pipe, and the pipe-to-be-laid is inserted into the collar. Ends of pipes and asphalt linings of collars are tapered to give a tight fit.

Joints are made tight with a ratchet-operated puller. Spanning the joint with steel rods attached to pipes with small chains, this puller rams the pipes into the collar.

The upper end of the pipe-to-be-laid is then supported exactly at line and elevation. Held at this point, wet sand is shoveled alongside the pipe. Sand is rammed and tamped under and around the pipe by laborers straddling it. Two to three feet of sand, also tramped down by laborers, is placed over the pipe. Balance of the trench is then backfilled. This procedure results in a firmly bedded sewer even in thoroughly wet sand.

Backfill is completed by a bulldozer. Excess water in the soil aids rapid compaction and settlement.

• **House connections**—Laterals extend from main sewers to one foot inside the curb. They're spotted to the property-owner's wishes—usually opposite house-plumbing outlets.

Laterals, 5 in. in diameter, are laid at ¼-in. slope per foot. They take off from street sewers through 45-deg cast-iron cut-in fittings. In deep sewers, fittings are turned up. A vertical riser extends to a 90-deg bend at an elevation to give not less than a 3.5-ft curb depth in wet ground.

Where cover is 3 ft or less, AC pipe and laterals are encased in concrete. Encasement is 6 in. below and on each side of the pipe, being smoothed off level with its top.

• **Two parallel sewers**—Sewers in some main streets are adjacent to Nassau County concrete pavements. To eliminate cutting across the concrete, 8-in. sewers are parallel to and on each side of the pavement. "It's cheaper to do this because concrete-pavement removal and replacement costs run from $15 to $25 per sq yd," Wood says.

Inspectors for the Village keep track of all construction, pipe and laterals laid and unusual conditions. One of their important jobs is to check the elevation of the concrete pavement daily. This is done before trenches are opened, while pipe is being laid and after backfilling. The reason: If there's settlement, the Village knows how much and when it occurred. These record data are good to have in case of a claim for pavement damage.

• **Odds and ends**—Infiltration tests on asbestos-cement sewers below groundwater show that leakage is about one-quarter of the specified allowable leakage—1,000 gal per mile per inch of

LOW BID PRICES

Lateral Sewer District No. 13, Freeport, N. Y.

Description	Quantity	Unit	Unit Price	Total Amount
8" A-C Sewer, Cut 0'-6'	14,745	lf	$6.00	$88,470
8" A-C Sewer, Cut 6'-8'	12,400	lf	6.00	74,400
8" AC-Sewer, Cut 8'-10'	1,655	lf	7.00	11,585
8" A-C Sewer, Cut 10'-12'	1,130	lf	8.00	9,040
Manholes (Concrete Block)	106	Each	280.00	29,680
Connection to Existing Manholes	6	Each	100.00	600
Cast Iron Pipe	1	Ton	300.00	300
5" House Lateral Risers	920	lf	5.00	4,600
5" Asbestos-Cement House Laterals (Sewer to Curb)	6,560	lf	2.50	16,400
Lumber, Sheeting, Bracing & Foundation	200	MFBM	125.00	25,000
Concrete Masonry (1:3:5)	160	cy	30.00	4,800
Reinforcing Steel	200	lbs	0.20	40
Masonry Excavation	10	cy	5.00	50
Additional Excavation	500	cy	0.50	250
Gravel Foundations	100	cy	5.00	500
Concrete Pavement or Pavement with Concrete base, Removal and Replacement	200	sy	15.00	3,000
County Pavement, Removal & Replacement	130	sy	20.00	2,600
Asphalt Pavement, Removal & Replacement	930	sy	4.00	3,720
Cinders	3,000	cy	7.00	21,000
Asphalt Surfacing	35,000	sy	0.40	14,000
Sidewalk, Removal & Replacement	12,500	Sf	0.40	5,000
Curb, Removal & Replacement	3,100	lf	1.60	4,960
Dust Laying Material	30,000	lbs	0.16	4,500
TOTAL (Manholes—Concrete Block)				$324,495

diameter per day. Sewer specifications usually allow about 600 to 2,000 gal. Tests were with a V-notch weir. Measurements extended over a 72-hr period.

Rate of pipe laying during rainy, high-tide weather was more than 190 ft per 8-hr day when the cut is 6 to 8 ft. With favorable construction conditions (dry weather and little ground water), it's 300 lf per day.

In 10-ft trenches, 52 to 60 ft of pipe is put down daily in bad weather. Normal production is about 150 ft per day.

Manholes are built of circular concrete block. Blocks are bedded on a concrete slab set about 10 in. below lowest pipe invert. They extend up to within three feet of the pavement. In this transition section corbled, circular blocks reduce the barrel diameter from 4 to 2 ft to fit frame and cover.

The AC pipe was bought from Johns-Manville Company, New York, N. Y. It was specified as 8 in., Class I.

• **Property owners pay**—To get new sewers, property owners must petition the sewer commission. Better than 50% of them (50% of the value of the property) must sign up to have the work done. The commissioners then form a district (such as, No. 13.) Sewers are designed, costs estimated, bonds floated and contracts let. After completion of construction, cost of the job is thrown into one pot. Benefits are then assessed against property owners on an area basis. Maximum depth of lot is considered to be 100 ft back from the street.

Property owners have 30 days to pay cash for their share of the improvement. After that, they're billed annually for their basic payment and interest. Payment extends over a 15-yr period.

• **Officials**—The contract for District 13 sewers is held by George Sammis, Freeport. His low bid was $324,495.

Herbert M. Wood partner in Baldwin & Cornelius Engineering Co., is Village Engineer for Freeport.

Members of the Freeport Sewer Commission are: Theodore Long, chairman; Michael J. Coffey and Edward M. Voelker.

Notes on legal decisions

Summaries of decisions relating to construction work prepared by I. Vernon Werbin, counselor at law and engineer, New York, author of Legal Phases of Construction Contracts (McGraw-Hill Book Co.)

Interpretation of subcontracts

A general contract was entered into for the construction of a dam. The contract involved considerable excavation and concrete work and a subcontract was entered into for the doing of all the concrete work called for.

The subcontract provided "that all quantities of work, whether increased or decreased, are to be performed at the following unit prices." The prices to be paid were then set forth. The concrete was to be placed in the excavations made by the general contractor.

The subcontract also provided as to payment that "the said contractor agrees to pay said subcontractor for said work herein set out, as it, the contractor, is paid for the work."

The general contract provided that where rock was excavated, the concrete was to be carried out to be in contact with the solid rock, even though the rock was outside the neat lines of the dam. The general contract also provided that all rock removed outside of the neat lines "shall be replaced by concrete at the expense of the contractor." While the main contract was incorporated in the subcontract by reference, this provision that the cost of the concrete outside of the neat lines shall be upon the contractor was not in any way altered or changed in the subcontract.

While the subcontractor was engaged in the performance of the work, he complained to the general contractor as to the size of the excavation and the general contractor stated: "We can't excavate any neater. They will have to pay for it." The subcontractor then said: "That is between you and the City of Harrisburg. Regardless of whether you get paid or not, I expect to be paid in full for it, and it will be paid."

After the subcontractor had performed the work, including a considerable amount of concrete in excess of what would have been necessary had the excavation been made within the neat lines, as indicated on the drawings, the general contractor refused to pay for that excess work. As a result the subcontractor brought action to compel payment.

At the trial the general contractor contended that furnishing concrete needed to fill between the neat line of the structure and the ragged faces of the rock was a hazard which the subcontractor foresaw and responsibility for which he assumed at the time the subcontract was entered into, since the general contract set forth specifically that payment for concrete would be limited to measurements within the neat lines and that no payment would be made for this excess concrete. As the general contract was incorporated in the subcontract by reference, the general contractor held that the subcontractor was not entitled to payment for such excess concrete placed outside the neat lines.

The case was tried before a jury which brought in a verdict for the subcontractor. This judgment was affirmed on appeal.[1] The appellate court, in its opinion, pointed out that the subcontract referred to the main contract primarily for the purpose of detailing the work to be done and the manner of its performance. "Its wording, establishing unit prices for the work to be done and providing that quantities of work shown therein 'are approximate only and are subject to increase or decrease,' considered in the light of the subsequent conduct of the parties, leads us to the conclusion it was the intent that the plaintiff [subcontractor] should be paid at the prescribed unit rates for the work made necessary by the defendant's [general contractor] failure to keep the excavation within the neat lines set forth in the main contract."

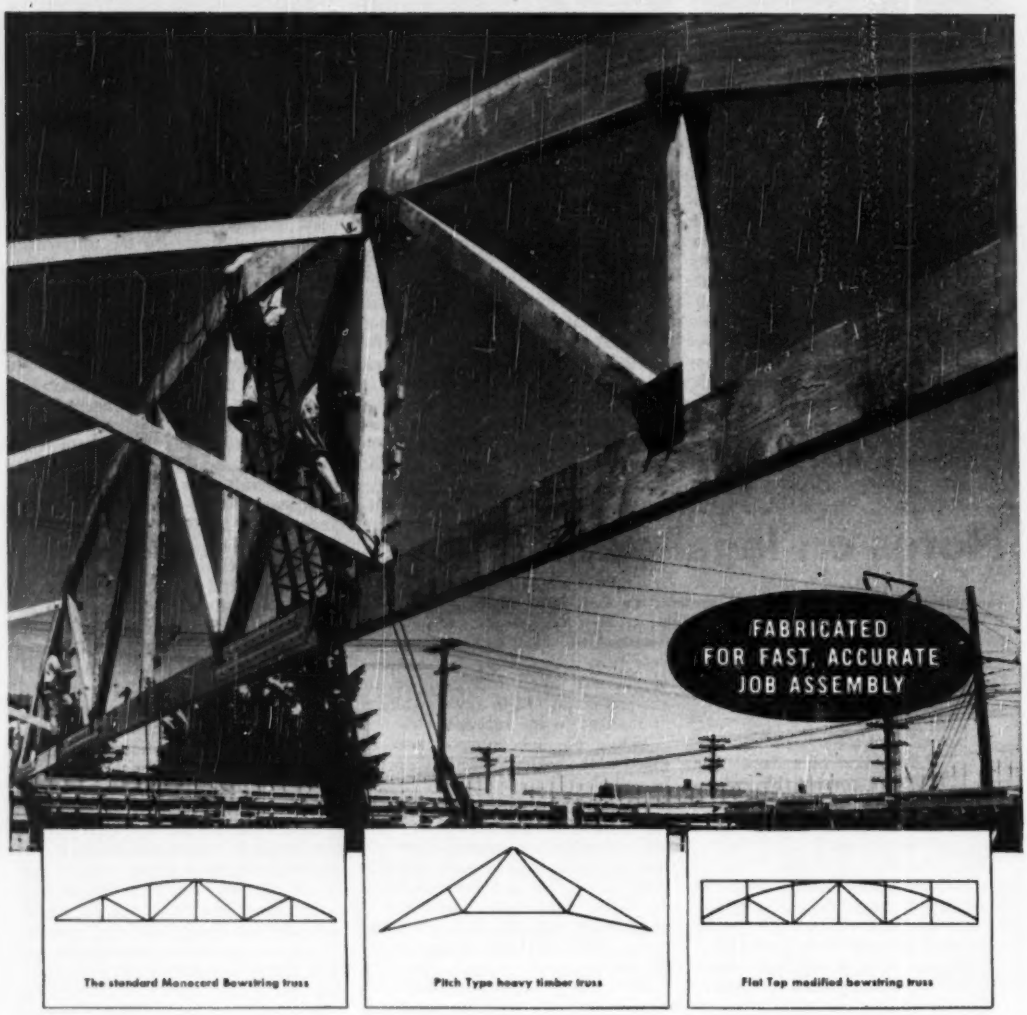
The general contractor's president, at the trial admitted that he knew before the work was started, that the rock excavation would extend beyond the neat line. Yet despite this knowledge, he had not seen to it that the subcontract, which was prepared by his organization, contained a clear and unequivocal clause indicating the general contractor's intention to shift the burden of the cost of this excess concrete to the subcontractor.

Since it is well settled that in case of ambiguity in a written contract, it will be construed most strongly against the party who prepared the contract, the court concluded that the failure to provide specifically that the subcontractor was not to be paid for this excess concrete, would indicate that the parties, at the time they entered into the subcontract, had no intention that the subcontractor was to assume responsibility for the placing of this excess concrete.

The court in its opinion stated further: "The responsibility here sought to be imposed would not be lightly assumed by the plaintiff [subcontractor], who had no control over the excavation easily made by blasting but difficult and expensive of repair by concrete. Such a penalty will not be created nor spelled out by mere inference when it is not clearly and unequivocally expressed in the contract."

(1) Moses v Edward H. Ellis, Inc., 72 A.2d 858, Supreme Court of New Jersey, April 24, 1950.

TIMBER TRUSSES...by Weyerhaeuser



The standard Monocord Bowstring truss

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READER COMMENT

General draft?

Sir: In preparation for the probability that a real showdown may occur, the contractors urge that they should have charge of emergency construction. Engineers urge that they should have charge. Politicians, Republicans, Democrats, separately, jointly, and otherwise, believe they should take over.

It is suggested, despite the particular efforts of various groups to do properly justified work in a sound and conscientious manner, that all —every man, woman, and child—be drafted in their present positions and assigned work in accordance with requirements and their capabilities by the most impartial methods possible and without profit or loss.

In the past two world wars it appears that everyone has tried to play his favorite angle with a patriotic tag if possible. The present rush to get the many projects completed is an example of the same thing again.

LE ROY M. HERSUM
Boston, Mass.

Better bridges of less metal

Sir: Erecting a 440 ft long, 340-ton framed 4-girder section of the Main River Bridge at Frankfurt in one operation (ENR Oct. 19, p. 29), is just one of the numerous examples for saving erection metal and falsework.

To cite others:

The 880-ton pier sections, 25 ft deep, and 4-girders wide of the continuous deck plate girder Rhine River bridge, Köln-Deutz (1948), were erected in one operation. Also the reconstruction of the Danube River bridges in Budapest was accomplished by erecting 154 ft truss sections and 144 ft arch sections in one operation. Incidentally, the latter refers to the "Margaret" Bridge, whose six flat deck, arch spans of box section, were much more economical than the conventional arched girders of the original bridge. The new bridge has a reinforced concrete floor, much heavier than the old: It was designed for a 20% heavier live load, it is 8.86 ft wider, and it contains 30% less metal than the earlier bridge. It is of riveted construction.

The procedure of erection also affects the quality and economy of welded bridges. As early as 1935, the 1772 ft long, all-welded through plate girder Strelasund Bridge of the German Railways was erected in units exceeding present records in this country. This 10-span bridge was built in two 5-span continuous units by Dörnen and Krupp respectively. Dörnen shipped 200.13 ft and 177.16 ft long sections, put them in place by floating equipment, making four field splices. Krupp welded a structure of 886 ft length weighing 1300 tons, in a rotating frame at the shore and pulled it into place. During this operation the end of the 177 ft long cantilevering portion deflected 2 ft. It was lifted by means of a short truss extension and hydraulic jacks on the rollers at each pier. Falsework was not used.

Turning to the reinforced concrete, the arch bridges over the Maas-Waal Canal (205.38 ft span) in Holland were rebuilt from 80-ton precast units and erected by the use of one bent at the center. Four reinforced concrete arch bridges were rebuilt in the same manner in Germany without any bents. The 370-ft span flat arch Neckar River Bridge at Heilbronn (1931) has been replaced by a prestressed structure of similar type. It contains 40% less metal and 16% less concrete than the famous bridge of 1931, despite the fact that it is 7.22 ft wider. The new arch bridges at Ulm and Münster are also of this prestressed type.

Metal savings up to 50% as compared to older bridges have been reported consistently. Efficiency of members and cooperation of the entire structure in carrying load have been achieved while building metal into bridges for erection purposes has been eliminated. In contrast to this progress with types of structures which are still nonexistent or novel in this country, the types, layouts and members of our long-span truss bridges of recent years are obsolete by 40-yr old standards. The same holds for the majority of our concrete bridges of all types. A diversion of 4% of the annual steel production for defense purposes would not diminish bridge construction volume if only a few of the well tried advanced principles could be introduced in design.

LOUIS BALOG
Consulting Engineer
Binghamton, N. Y.

A better short name

Sir: In India they use the word "HYDEL" as an abbreviation of HYDRO ELECTRIC. Does it not sound more descriptive than hydro plant to say hydel plant?

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Harza Engineering Company
Chicago, Ill.

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The Vulcan is a simple machine with only one moving part. It's easy to operate and it can't get out of order. Designed specifically for pulling sheet steel, wood, concrete, H-beams and pipe pile. Vulcan comes in three sizes—No. 200 for smaller work, No. 400 for heavier jobs and No. 800 for pulling the longest, toughest piles. Write for complete details.

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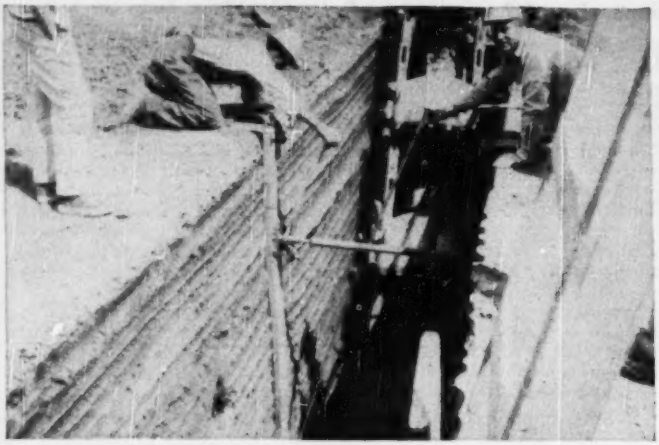
FIELD AND OFFICE



HYDRAULIC JACK ASSEMBLY, installed above midpoint of trencher's boom, provides support needed to prevent cave-in of walls of the partially excavated trench.

Jacks provide safety while installing shoring

The need for protection of men working in trenches has long been recognized. Not as well recognized is the problem of safety for workers engaged in the installation of protective shoring and bracing. According to the California Division of Industrial Safety, of 18 deaths from cave-ins, 6 were caused during placement.

With the help of the Division, a new safety trench jack and brace assembly has been devised. It is based on an idea by William C. Jones, Construction Safety Engineer, and was developed by McGuire & Hester, sewer contractors of Oakland, Calif.

The brace assembly features two hydraulic jacks. From a safe position on the surface, workmen can place the assembly into the trench and, by using long pipes, can use the jacks to tighten braces against the walls. Once the hydraulic assembly is in place, workman can go into the trench to place regular shoring and bracing alongside. The assembly can then be moved by workers outside the trench to next point of shoring.

The top illustration shows how this type of assembly was used with a trenching machine to excavate a 22-ft-deep storm sewer. Length of the trencher's boom made it difficult to prevent the walls of the partially excavated trench above the boom from caving in. Regular shoring to the lower end of the trench boom was not only difficult to install safely, but often failed to hold the walls above the boom. By installing the hydraulic assembly above the midpoint of the boom, the necessary additional support was provided from the surface. In this operation, the assembly also served to protect workers placing regular shoring, since it remained in position until the boom traveled out from under, and the full-depth regular shoring was installed.

TEMPORARY SHORING in place. Bar extending across the top is used to lift temporary assembly to next position.

FINAL PERMANENT SHORING is installed with maximum amount of safety and efficiency by outside-operated jacks.

EDUCATION and RESEARCH

FRASER RIVER MODEL—Canada's largest scale model of a river is on the campus of the University of British Columbia at Vancouver. Built by National Research Council engineers, it is a reproduction of the Fraser River delta, a section, about 8 miles wide and 19 mi long, of the Strait of Georgia into which the Fraser River discharges, and of the delta system with the tributary Pitt River and Pitt Lake to the limit of the tidal influence. The main purpose of the model with its delicate electronic equipment is for the study of proposed channel improvements between the ocean and the port of New Westminister, some 25 miles upstream. Also to be considered are how to remove sandbars, how to protect banks against scouring, and how to keep silt out of dredged channels leading to industrial sites. The model will also provide a source of general information about rivers which carry large quantities of silt and particularly those subject to tidal influences.—(Visual Educ. service photo.)

Engineer shortage grows

Professional engineers of Delaware are trying to stimulate interest in their vocation among high school students of the state. More than 200 boys from 20 high schools attended an "Engineers' Night" program recently in Wilmington.

The program, arranged by the Delaware Engineering Association and the guidance departments of the high schools, resulted from the growing concern over failure of students to complete engineering courses and the diminishing supply of graduate engineers.

The association's committee on student guidance and selection hopes to reduce the high rate of failure of engineering students in colleges by eliminating many who are not qualified to enter the course.

In the meantime, discussion of the shortage of engineers goes on.

Late statements include the following:

"All types of engineering graduates are needed now and will be even more urgently in demand in 1951"—Fred W. Ajax, associate dean of students, Georgia Institute of Technology.

"The total of engineering students graduated last June was the largest in history, but there was no surplus. They all found jobs. But as to the future, according to the official figures of the manpower committee of the American Society for Engineering Education arrived at in cooperation with the Bureau of Labor Statistics and the National Research Council, next year's class will be down 30 percent, 1952 down 50 percent; and in 1953 about 60 percent off as compared with this year".—Hugh H. Skilling, Stanford University.

"With many of the responsibilities confronting the United States, which it is impossible to undertake successfully without the services of engineers, we face the disturbing fact that the existing supply of engineers seems already fully absorbed. The shortage is not due mainly to the war in Korea. It developed before the war and would have become serious without an armed conflict. The war situation makes it just so much worse".—Livingstone W. Houston, president of Rensselaer Polytechnic Institute.

Educational Notes

Inservice training—The School of Public Health, University of Michigan, is offering an inservice training course in radiological health, Feb. 5-8, 1951, and another in water works problems, Feb. 15-16. The outline of course content of the former includes a discussion of the nature and source of radiation-natural and artificial; the

(*Continued on page 52*)

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FLOODLIGHT REFLECTOR
Burns 40 hours on 6 pints of Kerosene

This Model F. L. 6 Floodlight is shown complete with short stand—Weighs 27 lbs. Overall height 26 inches.
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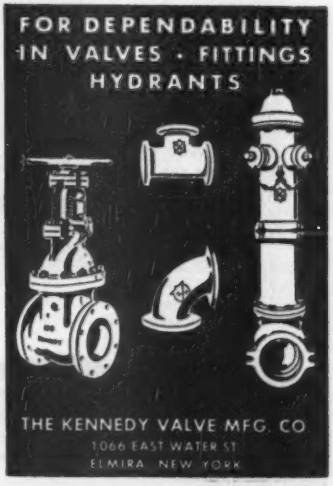

When Contractors Get Their Heads Together

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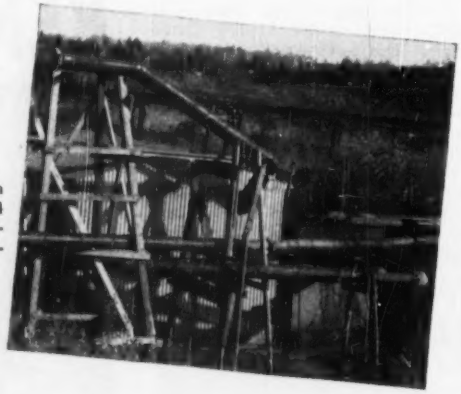

Sizes range from 4" to 30" in diameter; thickness from 14 to 7 gauge; all types of fittings, connections and fabrications.

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types and behavior of the properties; terms and values of units; and the basic principles of detection and the instruments used; public health implications are also covered, including radioactive waste disposal-solid, liquid and gaseous. Included in the water works course, among others, are discussions of toxicology as applied to public water supplies, determination of toxic materials, sodium and its relation to hypertension, determination of nitrates in water, and developments in fluoridation.

Cornell engineering scholarships – Sixty-six students from nine states and the District of Columbia have been selected as the first recipients of Burrell scholarships in engineering at Cornell University. Worth $200 each, the scholarships are awarded for the freshman year in any of the five undergraduate divisions of the college of engineering. The fund was established last year with a bequest of $170,000 left by Mrs. Katherine Ward Burrell, of Cleveland, in memory of her husband Edward P. Burrell, a Cornell alumnus.

Highway research – To make better and more economical roads for Iowa is the aim of three research projects now under way in the engineering experiment station at Iowa State College, which has received a grant of $50,700 for the work from the state highway commission. One team of researchers is looking for better ways to stabilize soils. A second project is the investigation of the feasibility of the design, construction, and operation of a track for testing highway pavements and bases. A third project is a continuation of Prof. Robley Winfrey's study of procedures for carrying on certain traffic surveys to determine the location of major streets and primary highways.

Dean Woolrich honored–Engineers of Travis county, Texas, have honored as their "outstanding engineer of the year" Dean W. R. Woolrich of the University of Texas. Dean of engineering at the university since 1936, he was guest of honor at a dinner held at Austin Nov. 14. J. Neils Thompson, director of the university research center, and president of the local chapter, National Society of Professional Engineers, was principal speaker.

Singing engineers–Touring the United States just now is the student chorus of the Institute of Technology, Helsinki, Finland. Their purpose is to raise funds toward the cost of student housing at the school.

MUNICIPAL AFFAIRS

BUSINESS DISTRICT and harbor of Toronto, Ont., looking east. The view also shows the islands in Lake Ontario forming an outside barrier as protection from the lake. The islands are used for parks and summer residences. The waterfront, largely reclaimed land, is used industrially, and has an airport within a short distance of the business district.—Photo Survey Corp. Ltd.

A $26 million improvement plan for Canada's second city

Toronto, Canada's second largest city, is starting on a $26,000,000 improvement plan to include new expressways, zoological gardens, police and court buildings, and parks and service buildings. The city is also in the midst of a plan to absorb the neighboring 13 municipalities to create a metropolitan area to cover roughly 50 miles from east to west and 20 miles from north to south. The plan is expected to be put into operation under a mandate of the Ontario provincial government within the next year.

Toronto, capital of the province of Ontario, has a population of about 700,000 in the city proper and in the Greater Toronto area the population is just over the million mark. It has more than 4,000 factories making everything from toys to jet fighter and commercial jet transport planes. It has about 400 branch plants of American and British companies, and last year saw 30 new industries established whose parent companies are in the United States or Great Britain. Multimillion dollar plants are now building in the suburbs for the production of glass, jet aircraft engines, automobiles, machine tools, refrigerators, rubber goods and numerous other products.

The first Canadian rapid-transit subway is being built under Yonge St., Toronto's main north-south traffic artery. A $30,000,000 undertaking of the Toronto Transportation Commission (ENR June 29, p. 36) it is to be finished by the end of 1953. Toronto's municipally-owned harbor is being further developed with new dock space and new factories and warehouses. The harbor, built to take traffic when the St. Lawrence Seaway is completed, has 9 miles of modern dockage, 820 acres of waterfront property now in industrial use, 130 acres of waterfront property still for sale or lease. Last year cargo handled in Toronto harbor amounted to almost 4,000,000 tons.

There is more building going on in Toronto than in any other Canadian city, including not only industrial plants, but also hospitals, commercial buildings (a bank has just finished an $18,000,000 head-office, and another last year opened a $6,000,000 regional head-office) but also individual homes and low-rental, municipally-owned housing developments. Toronto has more tall buildings in its business district than any other city in the British Commonwealth and Empire. Last year building permits for the city totalled $32,882,000. In the first six months of 1950 they totalled $30,811,000.

Toronto handles more rail, air and bus transport than any other city in Canada. Double-lane, divided express highways radiate from the city east and west, and one from the north end of the city will be ready next year.

A $179,000,000-plan for development of Toronto, has been approved by the Ontario Department of Planning and Development. This 30-year plan includes new traffic arteries, civic squares, a new courthouse and police headquarters and improvements to water and sewerage facilities.

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The USF all-steel Utility Building is your economical answer to either a portable or permanent structure at lowest cost. Frames are prefabricated and pre-fit formed steel that simply bolt together. Box corrugated steel roofing and siding sheets attach with clip-and-wedge fasteners. No special tools are needed, no field punching, welding or riveting. Manual erection is generally possible on all but long span trusses. Suitable for permanent use or readily dismantled and transported.

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DEVELOPMENTS ABROAD

Austria now seen ready to export hydro power

Austria is in the enviable position of having power for export. The scheme under study envisages a 2,400,000-kw surplus. No extra-long transmission lines will be required to deliver this excess energy to the networks of neighboring countries—Germany, Italy and Switzerland.

Four companies have been established to study new generating capacity. In addition, another firm is working on a scheme for twelve power stations to be built along the Danube.

New developments under study are: Oetz Valley in the Tyrol, 8 stations, 1,041,000 kw; Inn River, a tributary of the Danube rising in Switzerland, 392,000 kw; Bregenzer Ach, tributary of the Bodensee in western Austria, 533,000 kw at nine sites (four of them for storage only). Fourth, in eastern Tyrol, 430,000 kw is the estimated potential capacity.

Set international congress on prestressed concrete

An international congress on prestressed concrete is being sponsored by the Association des Ingenieurs Sortis des Ecoles Speciales de Gand, in connection with the celebration of its 75th anniversary. The meeting will be held Sept. 10 to 13, 1951, in Ghent, Belgium.

The main purpose of the congress is to present a symposium of up-to-date information on prestressed concrete. Papers in French, English and Dutch are being solicited, but they must be submitted before next April 15. Further information on the program, fees and hotel reservations may be obtained from F. G. Riessauw, secretary, Congress International du Beton Precontraint; 59, Rue Neuve St. Pierre, Ghent, Belgium.

Mexican research agency

A new industrial research unit will begin functioning about Jan. 1 at Monterrey, Mexico, in close collaboration with the Monterrey Institute of Technology.

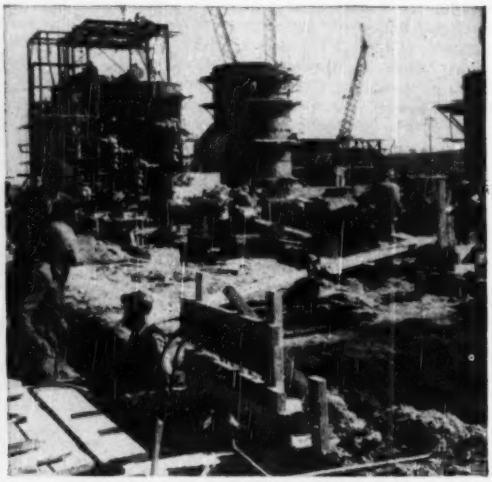
The new institute, established in collaboration with the Southwest Research Institute, of San Antonio, Tex, under the direction of Harold I. Vagtborg, is to be a non-profit industrial research organization.

Germany needs new docks but lacks necessary funds

Germany has had to abandon plans to build urgently needed new docks because of lack of capital. Shipping experts emphasize the need for docks since half of Germany's dock capacity was destroyed in the war.

Allied High Commission Law No. 24 says Germany may now extend shipyard capacity by building, repairing, purchasing, etc.

STORAGE AND SIGHTSEEING—A new 150,594-gal. elevated water tank constructed at Sao Paulo, Brazil, by Francisco Azevedo, Travassos & Cia. Ltda. combines water storage and a sightseeing tower. The tank itself has a diameter of about 36 ft. and an effective depth of 15 ft. The top of the entire structure is about 125 ft. above ground level, while top water level is about 120 ft. above ground. The structure is of reinforced concrete, with the eight supporting pillars carried down to foundations 30 ft. below ground level. Five floor levels were built, the lower four being enclosed and the top one open as a sightseeing tower and inspection space.



BRITISH REFINERY—At left are mixers at the concrete and aggregate plant for new oil refinery at Fawley (ENR Dec. 14, p. 14). There are two mixers each with a capacity of 3 cu yd. Their total maximum output is 140 cu yd per hour. At right is a general view of single stage crude unit showing sections of the tall fractionating towers being fabricated.—(Eastern Pub photo.)

SINCE May 1948, the Checker Cab Co. of Milwaukee has been giving its drivers a unique reaction test. The results have proved that drivers can stop quicker on concrete than on other pavements.

To make this test, two tiny guns are mounted on the test car—each loaded with a blank cartridge and capsule filled with yellow chalk. Frank Loh, who conducts the tests, rides beside the driver and fires one gun without warning. The exploding cartridge drives the chalk-filled capsule against the pavement, leaving a yellow mark.

The explosion is the signal to stop. When the driver applies the brakes the second gun automatically fires, leaving a second yellow mark. The distance between marks is the number of feet traveled before applying the brakes. The distance between the second mark and the front bumper of the halted vehicle is the number of feet required to stop.

Mr. Loh says, "These tests prove that at 20 miles per hour a car can be brought to a full stop 8 to 10 ft. sooner on concrete pavement."

These tests confirm what millions of motorists learn about the superior stopping power of concrete when they must stop quick in an emergency. Drivers soon learn, too, that they can be more relaxed when driving on concrete because of its other built-in safety features: (1) its gritty surface, which has uniformly high skid resistance, wet or dry, (2) its light color, which reflects more light at night, thereby increasing visibility during the most dangerous driving hours and (3) its freedom from hazardous ruts, bumps and chuck holes.

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MEN AND JOBS

Vincent J. Lamb, city engineer of Watervliet, N. Y., has been granted a year's leave of absence to do work for the State of New York. He will return to his duties on Sept. 13, 1951. The city council appointed Frank J. Reis to serve as city engineer in the interim.

George R. Roberts, civil engineer, retired recently as chief of the Public Buildings Service Construction Section of General Services Administration.

Hugh Emmerson Mahood, graduate of the University of Saskatchewan has been appointed as Irrigation Engineer, Department of Agriculture.

Lt. Col. Robert P. Kline, Lehigh, 1930, formerly area engineer for the Antilles and Panama areas, has been assigned to the Washington District as area engineer, Camp Ritchie, Md. Formerly Colonel Kline was employed by the Dravo Corporation and the Baltimore and Pittsburgh districts of the Corps of Engineers.

Changes in the Phoenix, Ariz., department of public works have been authorized to separate the water department from the engineering division and reorganize the water department. **R. Gail Baker** remains as city engineer, and **Dario Travaini,** superintendent of sewage disposal and water production, becomes superintendent of the water unit. **Perley M. Lewis,** assistant superintendent of the water system, will also work as field engineer.

George Fisher has been appointed city engineer of Pasco, Wash., filling a vacancy left since the resignation of Clarence Shain nearly a year ago. Fisher previously has been assistant Franklin County engineer at Pasco.

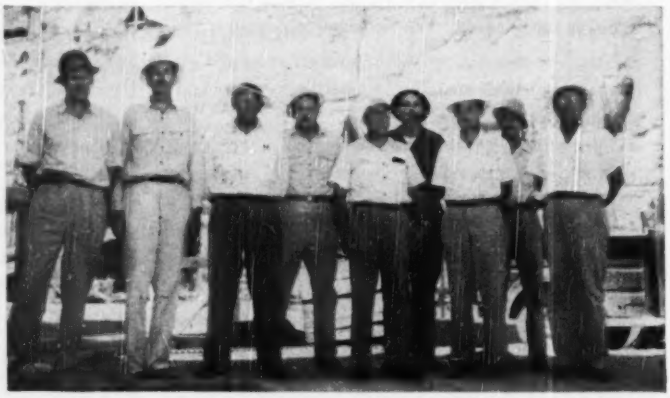
Robert B. McKenna, assistant superintendent of highways, Stoneham, Mass., has been appointed superintendent of Public Works.

Col. Earl E. Gesler, former district engineer at Philadelphia, Pa., became president of the Beach Erosion Board Sept. 30. He succeeded **Col. Dabney O. Elliott,** retired after 36 years of important military and civil works posts with the Army Engineers. The Beach Erosion Board is a Corps of Engineers agency authorized by Congress to cooperate with the states. At Philadelphia, the new district engineer is **Col. Ralph E. Cruse.**

William J. Byrne has taken over new duties as county engineer for Allamakee County, at Waukon, Iowa.

Henry Ten Hagen has been appointed deputy chief engineer in the N. Y. State Department of Public Works, division of construction, canals and waterways, and flood control. He is a 1913 civil engineer graduate of Cornell and went to work with the state highway commission that same year. He has been with it ever since except for war service in the first world war.

Cecil E. Rhodes is special projects district engineer for the Asphalt Institute.



Top engineering management for construction of the Corps of Engineers' $166,000,000 Fort Randall Dam project on the Missouri River in South Dakota are, left to right, C. B. Stokes, assistant area engineer; T. J. Reading, head of the concrete section; B. M. Babb, resident engineer on embankment; J. W. Gillam, head of the survey section; B. L. Edwards, assistant resident engineer; M. R. Howard, resident engineer on tunnels and outlet works; John Trantina, geologist; E. E. Wohlford, office engineer; and R. L. Fitzhugh safety engineer.

Jack E. MacDonald, superintendent of construction for the British Columbia Electric Co., has been placed in charge of all company construction, including transmission and distribution lines. A graduate of the University of British Columbia, he joined the company in 1939 as a construction engineer after working with the West Kootenay Power and Light Co. During the war, he served as aeronautical engineer with the RCAF. In 1945, upon his return, he served as construction engineer and in 1946 was made superintendent of construction.

He will be in charge of studies of asphalt uses in developing the reclamation program.

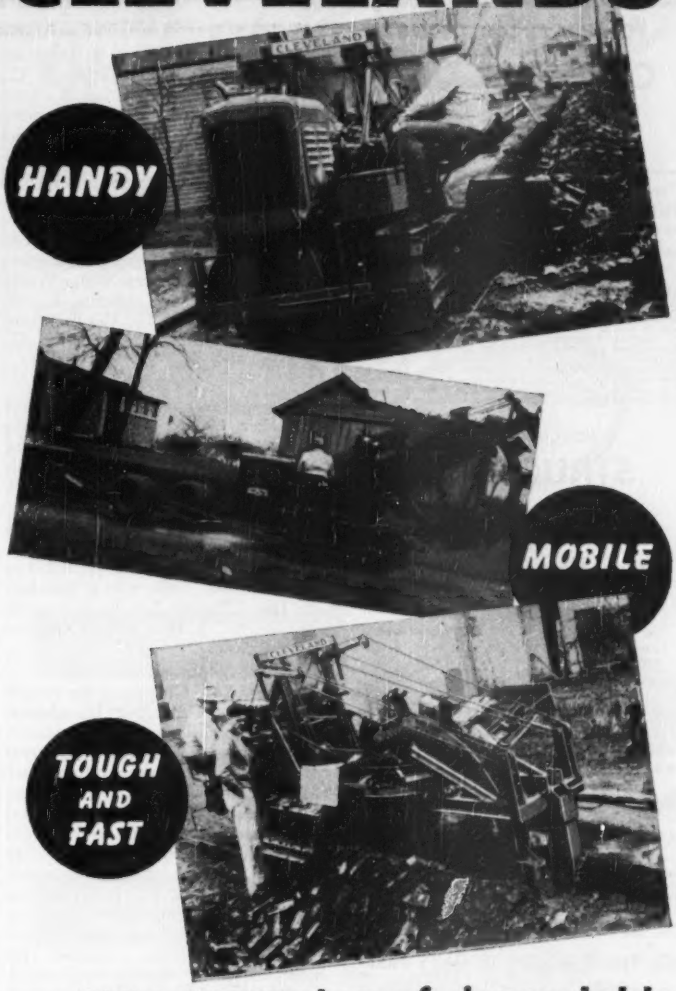
Rear Admiral Ellis Reed-Hill, who recently completed a 4-year term as Coast Guard Engineer-in-Chief, has retired. In 1912 he received his commission as an ensign in engineering and later received a B. S. degree in marine engineering from the University of Michigan. In 1935 he was assigned to Coast Guard Headquarters, Washington, D. C., as a member of the Permanent Board.

James F. MacLaren Associates, consulting engineers, have opened an office at 705 Yonge St., Toronto 5, Ont., to specialize in municipal engineering—water supply and purification, sewerage and sewage disposal, drainage, flood control, and planning. Mr. MacLaren for 16 years was a partner of Gore and Storrie.

Patrick W. Cosgrove, Hazel Park, Mich., assistant city engineer, has been named acting city manager.

Joseph H. DeFoe, newly appointed director of the recently created Department of Public Works in Wakefield, Mass., left a similar position in Lexington.

CLEVELANDS



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MEETINGS

Southeastern Concrete Pipe Manufacturers Association at its third annual meeting in Charlotte, N. C., elected Henry O. Strohecker president; Thomas Arp, Knoxville, vice-president; Vernon Kyle, Atlanta, secretary, and L. D. Weaver, Flomaton, Ala., treasurer. Next year's meeting will be held in Knoxville, Tenn.

Sherman Russell, of Atlanta, has been elected president of the Southeastern section of the American Water Works Association. Other officers T. M. Rogers, Easley, S. C., vice-president, and T. A. Kolb, Columbia, S. C., secretary-treasurer.

C. Forrest Tefft, of Columbus, Ohio, has been elected president of the Structural Clay Products Institute, national association of brick and tile manufacturers. L. S. Meyer, of St. Louis, Mo., has been named vice-president; George Gammie, of Chicago, treasurer; and Joseph J. Cermak, Washington, D. C., was reelected as secretary. Mr. Tefft, who is president of The Claycraft Co. in Columbus, succeeds W. J. Goodwin, Jr., of Des Moines, Iowa.

The New York Chapter of the American Institute of Architects has adopted a resolution calling for the appointment by the N. Y. State Association of Architects of a special committee to investigate violations of the Education Law which prohibits anyone except licensed architects from practicing architecture or using a title to indicate he is a registered architect. It is claimed that unlicensed persons improperly call themselves "architectural designers," and that certain builders, contractors, industrial and store designers, though unlicensed, have flouted the law designed to protect public health and safety by performing architectural services.

Officers of the Mahoning Valley (Ohio) Society of Professional Engineers are A. L. Thurman, president; F. A. Reilly, vice-president; W. E. Ault, secretary; and H. E. Withers, treasurer.

How highway engineering problems are solved through the photogrammetric use of aerial photographs will be revealed in a symposium on "Photogrammetry as Applied to Highway Engineering," to be presented at the annual meeting of the American Society of Photogrammetry, Jan. 10-12 at the Shoreham Hotel, Washington, D. C. The symposium will be led by William T. Pryor of the U. S. Public Roads Administration, and representatives of highway and public works departments of California, Florida, Massachusetts, Michigan, Mississippi and Ontario will participate.

O. C. Reedy, assistant regional planning engineer for the Reclamation Bureau at Billings, Mont., was elected president of the newly-organized Billings branch, American Society of Civil Engineers. Royal H. Brill, Montana Power Co. engineer, was elected vice-president, and Benson F. Kelly, office engineer for the Reclamation Bureau, was elected secretary-treasurer.

Charles J. Stevens of the Navy Bureau of Yards and Docks has been elected president of the Washington, D. C., Section, American Society of Civil Engineers. Other officers are Waldo E. Smith, vice-president; Vincent B. Smith, secretary.

CALENDAR

Highway Research Board, National Research Council, annual meeting, Washington, D. C., Jan. 8-12.

American Society of Photogrammetry, annual meeting, Shoreham Hotel, Washington, D. C., Jan. 10-12.

N. Y. Section AWWA, luncheon meeting, Park-Sheraton Hotel, New York City, Jan. 16.

Louisiana Engineering Society, St. Charles Hotel, New Orleans, Jan. 18-20.

Industry—College Conference, Case Institute of Technology, Cleveland, Ohio, Jan. 20.

Canadian Construction Association, Chateau Frontenac, Quebec, Ont., Jan. 21-24.

National Association of Home Builders, annual convention and exposition, Stevens and Congress Hotels, Chicago, Ill., Jan. 21-25.

Conference, Wisconsin County Highway Commissioners and County Highway Committee Members Association, Milwaukee, Wis., Jan 23-25.

Third California Conference on Street and Highway Problems, University of California, Berkeley, Jan. 24-26.

Associated Equipment Distributors, annual meeting, Stevens Hotel, Chicago, Ill., Jan. 28-Feb. 1.

Midwinter Housing Conference, S. W. Research Institute's division of Housing and Construction Technology, Statler Hotel, Washington, D. C., Feb. 13-14.

Illinois Annual Conference on Highway Engineering, Urbana, Ill., Feb. 20-22.

American Concrete Institute, St. Francis Hotel, San Francisco, Calif. Feb. 20-24.

Industrial Waste Conference, Purdue University, La Fayette, Ind., Feb. 21-23.

American Road Builders Association, Schroeder Hotel, Milwaukee, Wis., March 12-14.

American Railway Engineering Association, Chicago, Ill., March 13-15.

N. J. Sewage and Industrial Wastes Association, Haddon Hall Hotel, Atlantic City, N. J., March 14-16.

N. Y. State Association of Highway Engineers, Rochester, N. Y., March 28-30.

OBITUARY

Col. Frank H. Forney, 44, former U. S. district engineer at Buffalo, N. Y., has been killed in action in Korea, where he was commanding the 19th Engineers Combat Group. He was graduated from West Point in 1929 and joined the Corps of Engineers. He later attended the University of California and received a civil engineering degree. Then he had many Army assignments, including two years with the 11th Engineers at Corozol, Canal Zone. Subsequently he was assistant professor of military science and tactics at Johns Hopkins University. He went overseas, ETO, in 1944 as CO of the 1132d Engineer Construction Group, and later was almost two years in South Pacific as deputy engineer for U. S. forces in Australia. Returning, he was district engineer at Buffalo till last June when he left for Korea.

Brig. Gen. William P. Wooten, 77, Army Corps of Engineers, retired, and former editor of "The Military Engineer," died in Washington, D. C., Dec. 12. A graduate of the University of North Carolina and of West Point in 1898, he was commissioned a second lieutenant in the Engineers and served in the Philippines in the Spanish-American war. During World War I he commanded the 14th Engineer Regiment in France, and later was chief engineer of the Third Army. At his retirement in 1930 he was in charge of levee construction and flood control work on the lower Mississippi.

Alfred E. White, 62, for many years engineer for the New Hampshire Highway Department at Keene, died at White River Jc., Vt., on Dec. 1. He was a native of Cambridge, Mass., and received his engineering education at Columbia University.

Frederick S. Woods, 88, professor emeritus of mathematics at Massachusetts Institute of Technology, died Dec. 1 in Boston. A member of the MIT faculty for 44 years prior to his retirement in 1934, Professor Woods was the author of two books on calculus and advanced geometry. He was graduated from Wesleyan University in 1885; received a master's degree in 1888. After studying in Germany he joined the staff of MIT in 1890, and was made a professor six years later.

Frank A. Randall, 67, of Winnetka, Ill., structural engineer, died Dec. 2 in Evanston, Ill. Practicing in Chicago since 1905, he had been a structural

(Continued on page 60)

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2½ HP Motor. Powerful enough to handle the stiffest mixes with maximum length of shaft (28'). Operates from light-socket; 115 volt, single phase AC or DC. 8,000 to 10,000 VPM. Weighs only 50 lbs. Available with three vibrator heads for thin or thick sections. Model No. FS-150A.

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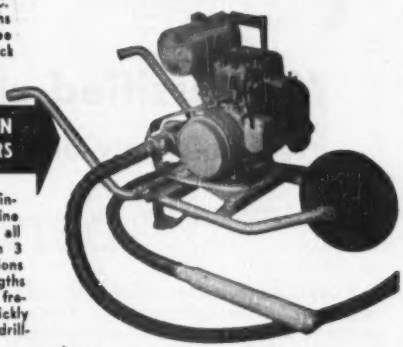
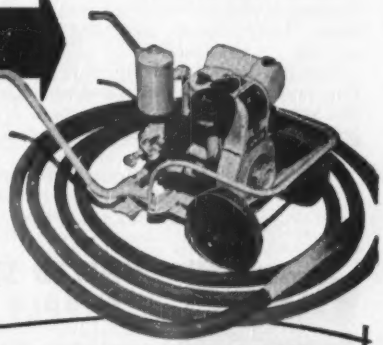


Proved on countless jobs the finest of its class. 4.7 HP engine — plenty of power under all conditions. Available with 3 heads for thick or thin sections and shafting in 7' and 14' lengths up to 28'. Instantly variable frequency up to 7500 VPM. Quickly converted to grinding and drilling. Model FS-6A.

THE HYDRAULIC with the TIME-SAVING 50' REACH



the hard-to-reach spots are easily accessible with this machine and much time is saved by eliminating changes of power unit location. All moving parts run in oil under pressure—no maintenance required. 7 HP engine and 2¾" head assures perfect compaction under most severe conditions. 4,000 to 7,000 VPM — instantly variable. The finest vibrator of its type money will buy.

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UNITED STATES STEEL

and consulting engineer in the Chicago department of subways and superhighways. Previously Mr. Randall had been a consulting bridge engineer for the Chicago Park District, a building commissioner for the Century of Progress Exposition, in charge of the Outer Drive improvement in 1936 and 1937 and he had worked on Chicago's traction plan.

Francis S. Russell, 74, a sanitary district engineer for the last 15 years, died Dec. 1 in Chicago.

John C. Dunphy, 75, formerly a member of the Illinois state highway department and commissioner of streets of Aurora, Ill., died Nov. 25 in that city.

Paul F. Pie, 68, of Newark, Del., retired project engineer of the Atlas Powder Co., died Nov. 28 in Wilmington, Del. He was graduated as a civil engineer from the University of Delaware in 1906, and had been associated with the Atlas Company for 24 years when he retired about four years ago.

Thomas G. Dunn, 64, of the staff of the U. S. Corps of Engineers at Louisville, Ky., died at Jeffersonville, Ky., Dec. 2.

Addison A. Bond, 76, retired civil engineer, of Port Neches, Tex., died at Port Arthur, Tex., Nov. 21. For many years he was chief engineer of the Tennessee Coal and Iron RR Co. at Birmingham, Ala. He had done some spectacular railroad engineering work in the Andes, Ecuador. He worked with the U. S. Army Engineers in World War II.

Harald Carlstedt, 72, construction engineer, died at East Orange, N. J., Nov. 30. He had been with Nicholas S. Hill Associates, and Stone and Webster Engineering Co., New York City.

Col. Earl Marsden, 43, who served as executive officer of the Manhattan Engineer District, has been killed in Korea, where he had been since the Inchon landing in September. He was a graduate of Yale's Sheffield Scientific School. In civilian life a construction engineer, he had been in military service almost continuously since the start of World War II.

Harry W. Shearer, 75, who was one of the civil engineers employed in the construction of the Panama Canal, and who retired from government service 13 years ago, died in Chambersburgh, Pa., Dec. 1.

UNIT PRICES BID BY CONTRACTORS

Falcon Dam and power plants, Texas-Mexico

A joint bid by seven firms on Schedule 1, contingent upon award of Schedule 2, was successful at $7,801,064 for construction of the international Falcon Dam and power plant on the Rio Grande River. The United States and Mexico International Boundary and Water Commission opened bids Oct. 30, 1950, in El Paso, Tex., for the American section (Schedule 1) and in Cd. Juarez, Chihuahua, for the Mexican section (Schedule 2). L. M. Lawson is the U.S. Commissioner.

The contractors could bid a) on either schedule, or b) on both. Only three of the eight bidders on Schedule 1 submitted both "a" and "b" bids. The three "b" bids were 27.3% apart with the successful low 10% below the same firm's "a" bid and 10.6% below the next to low bid. The high of eight "a" bids was 101% above the low.

Falcon Dam site is located about 75 miles downstream from Laredo, Tex. It is a rolled earth filled structure with a total axial length of 26,294 feet of which 10,133 feet are in the U.S. It is 150 feet high with a crest width of 35 feet. The spillway is through the U.S. abutment. The U.S. outlet works consist of a concrete gravity dam, 120 feet high, with three gated control openings leading to the penstocks.

A power house will be built on each side of the river. The U.S. plant will have colored concrete floors and stairs. It will have three vertical-shaft, Francis type turbines to develop 14,750 hp and three 3-phase, 60-cycle generators of 10,500 kilowatts, 6,900 volts.

Bidders on Schedule 1 included:

1 "b" bid (contract), by C. F. Lytle Co., Sioux City, Iowa; Amis Constr. Co., Oklahoma City; Edward Peterson Co., Omaha; Tellepsen Constr. Co., Houston; Foley Bros., Inc., St. Paul, Minn.; Massman Constr. Co., Kansas City, Mo.; San Ore Constr. Co., McPherson, Kan.	$7,801,064.00
2 Same firm's "a" bid	8,600,980.00
3 H. B. Zachry Co., Laredo, Tex.; Brown & Root, Inc., Houston "b"	8,625,149.60
4 Guy F. Atkinson Co., S. San Francisco, Calif. "b"	9,792,533.50
5 L. P. Reed, Inc., Meridan, Tex., "a"	17,250,045.00

Items	Quantity	Unit prices 1a	1b (C)
Excavation			
Com. for fndn	470,000 cy	$.40	$.36
Com. spillway	129,000 cy	.98	.89
Rock, spillway	739,000 cy	.98	.89
Alt cl, cut-off tren	6,400 cy	9.00	8.13
For U. S. power sys common	320,000 cy	.91	.836
rock	441,000 cy	.91	.836
Prot cost to fndn surf, Bit f & a	20,600 sy	1.20	1.11
Conc, a	6,000 cy	2.40	2.18
Reinf fabric, pl	3,000 lb	.20	.164
Backfill	55,000 cy	.40	.36
Excav, com, strip Chapeno borrow area	61,000 cy	$.38	$.34
Excav, com, in Chapeno borw ar & trans to dam embank	1,270,000 cy	.38	.34
Earth fill in dam embank, zone 1	1,021,000 cy	.10	.09
Spec compac of earth fill in embank	cy 23,000	3.20	2.88
Sand, grav fill in embank, zone 2	cy 630,000	.10	.09
Rock fill, dnstream slope, zone 3	cy 140,000	.30	.27
Riprap from stk pile, f & p	cy 130,000	.90	.82
Grout holes in stage, d, depths 0'-35'	lf 3,100	2.40	2.18
35'-60'	lf 2,200	2.40	2.18
60'-110'	lf 1,300	2.40	2.18
Metal pipe, fits for fndn grt'g & drainage, f & p	lb 11,000	.60	.54
Mtl pipe, fits for contrac jt grt'g, p	lb 5,000	.35	.32
Pres grouting	cy 1,850	2.40	2.18
with packers	cy 2,750	2.70	2.45
contrac joints & cooling sys	cy 400	4.25	3.85
Drn holes less than 50' deep, d	lf 3,200	4.75	4.31
8" sewer pipe, f; const embank toe dr w/uncmt jts embed in grav	lf 2,350	2.00	1.80
10"	lf 1,200	2.00	1.80
6" sewer pipe f; const dr w/uncmt jts embed in grav	lf 21,000	1.50	1.36
8"	lf 18,000	2.00	1.80
8" swr-pipe dr w/ cmt jts, f & lay	lf 250	2.00	1.80
10"	lf 150	2.50	2.27
24"	lf 1,400	9.00	8.16
24" 14-gage CM pipe	lf 130	6.00	5.40
Dr holes for anchor bars, gr in pl	lf 51,400	1.30	1.18
Pl reinf bars	Mlb 15,650	.035	.031
Concrete in:			
US intake struc below el 312.5	cy 47,800	12.65	11.65
abov el 312.5	cy 3,900	19.00	17.25
Trashrack struc	cy 2,650	35.00	31.70
Spillwy struc, below bridge seats	cy 26,200	14.00	12.70
Spillway bridges, twr, supstr	cy 4,600	53.00	48.00
Slope pav inlet to spilwy; intake struct	cy 420	13.00	11.80
Floor fin inlet, intak, spilwy chute fl	cy 26,300	12.00	10.90
Spilwy stil'g basin floor	cy 29,000	12.00	10.90
Cantl. cntrft wall	cy 27,800	34.00	30.85
Gravity wall	cy 550	17.00	15.40
Access. dr, watr-line galleries	cy 720	39.00	35.40
Encas for penstk & outlet pipes	cy 3,200	21.25	19.25
Mass conc in pwr plant struct	cy 2,500	9.00	8.15
1st stage conc in p-pl substr	cy 7,600	21.00	19.00
In interm struc	cy 8,000	51.00	46.25
In super str	cy 1,600	102.00	92.50
Conc in plant stairs & landings	cy 80	125.00	113.50
2nd stag conc, plant	cy 3,100	25.00	23.65
Conc in pav gutr	cy 100	38.00	34.50
Dam embank curb	cy 555	46.00	41.80
Blockouts	cy 600	67.00	60.75
Cooling conc	cy 33,800	1.00	.91
Pl mtl tubg, fits for cone cool sys	lb 35,800	.26	.24
Joint filler, f & p			
Prefrm dsby cork	sf 6,330	2.00	1.80
Preform bit	sf 8,470	.60	.50
Preform elastic	sf 5,100	1.00	.91
Const control jts	lf 600	3.00	2.72
Temp jt fill, f, p, r	sf 3,400	2.00	1.81
Asph seals in intak struc, const	lf 600	6.00	5.44
In power plant	lf 200	6.00	5.44
Rubr watr stops, p	lf 950	3.00	2.72
Rubr jt strips, i			
W/mtl strips	lf 70	4.00	3.80
Without mtl strps	lf 130	3.00	2.70
Mtl gr grv cov, f&p	lf 300	2.00	1.80
Shaped mtl seals, f & p	lf 6,100	2.30	2.09
Str mtl seals, f & p	lf 5,900	1.90	1.72
Cont-tar-sat-felt rf, f&p	sf 350	.50	.46
Felt base flash, mtl cntr-flsh at walls, curb; fndn pad for rf, membr watrpr, f & i	lf 1,000	$1.40	$1.27
Deck insul, f & p	sf 1,800	.80	.73
Membr watrpr, f&p	sf 15,700	.70	.63
Mtl bs flash, cntrd at wall, curb for membr watrpr, f&i	lf 450	2.00	1.82
Conc, plant cov slabs	cy 320	18.00	16.30
2-ct asph emul dampproof, f & a	sy 500	.80	.73
Bonded conc fin			
Uncolr, fl & stair	sy 1,760	4.00	3.60
Colored on:			
Fl & landings	cy 1,370	6.00	5.40
Stairs	sy 99	8.00	7.30
Colored bond-conc wall bs around fl, landings	lf 1,100	.70	.63
Along stairs	lf 190	1.50	1.40
Colr bond-conc fin on:			
Stairs, landin curb	lf 130	1.50	1.40
Fl, balcny curb	lf 180	1.50	1.40
Mtl, glz parts, i	sf 310	1.00	.90
Mtl toilet-stall, urinal, toilet rm parts, i	lf 50	4.00	3.62
Frm, guide for fix-wh & bkhd gates, i	lb 729,000	.09	.082
Fix-wh gates, erec mast, mtlwk for cntr-weights & mast, i	lb 2,800,000	.06	.054
Bulkhead gates, i	lb 21,000	.06	.054
Gate hoist, i, for:			
Penstk fix-wh gt	lb 60,000	.09	.082
Spilwy gates	lb 1,043,000	.08	.073
Trshrack guide, bear plates, i	lb 59,000	.09	.082
Trashracks, i	lb 220,000	.05	.045
Stop-log guides, i	lb 110,000	.09	.082
Paint stoplog, lift beams, frames	sf 31,700	.30	.27
Cranes, i	lb 384,000	.04	.036
Track rail on conc, i	lb 103,000	.05	.045
Struc at frmwk in plant, erect	lb 250,000	.06	.054
Hole-jet vlv, i	lb 129,000	.05	.045
Mot driv pumps, i	lb 17,000	.14	.127
Mtl pipe, fit, vlv			
Less 6", f & i	lb 129,000	.40	.363
6" & larger, f & i	lb 294,000	.36	.327
Serv, hose cabnt, i	lb 1,500	.30	.272
Penstk, outl pipe, i	lb 1,685,000	.09	.082
Embed mtl frm (fl, wall, deck openg)	lb 16,000	.14	.127
Fl plate, grat, cov, i	lb 10,500	.04	.036
St swing doors, i	sf 1,000	3.50	3.17
St fire doors, i	sf 100	2.00	1.81
St roll doors, i	sf 750	1.00	.90
St-sash windw on embed tub mtl frms, f & i	sf 970	4.00	3.60
St-sash windw in conc grooves, f & i	sf 160	4.00	3.60
St louv in ext walls f & i	lb 600	1.50	1.36
St handrails, i	lb 51,000	.25	.227
Mtl stairways, i	lb 32,000	.20	.18
Alum safety nosg, f & i	lf 900	3.00	2.72
Ventilators, i	lb 700	.50	.45
Slot mtl insert, f&i	lb 6,000	.50	.45
Wire inserts, f & i	lf 600	.10	.09
Anchor bolts, i	lb 91,000	.30	.272
Misc metal work, i	lb 35,000	.25	.227
Plumb fix, storage watr heat, elec drink watr coolr, i	lb 3,500	.40	.36
Kit assembly, i	ea 1	700.00	635.00
Embed elec conduit 1½" or less, mtl, i	lf 27,250	1.20	1.10
1½"-3", i	lf 6,000	1.00	.91
3" or larger, i	lf 860	3.00	2.70
Nomtl, i	lf 1,500	2.00	1.82
Grnd wires, rods, i	lb 5,000	.75	.68
Sngl condtr, 5,000 v insul trnch lay cbl, i & connect	lf 500	3.00	2.72
Series lgt sys stds, fix on rd, pkar, i	std 4	70.00	63.00
Stab bse crs surf	cy 5,600	2.50	2.27
Asph surf trt agg	cy 1,850	2.50	2.30
Surf trt asph, f & p	gal 38,500	.30	.272
Erect guardrail	lf 15,600	1.20	1.09
Setlmt appar holes 4", dr	lf 40	7.00	6.35
Test appar trnchs	cy 15	10.00	9.00
Setl appar in dam, i	lb 1,600	1.00	.91
Dam surf stlmt pt, i	ea 85	14.00	13.00
Trans matl for Comn & agents other than contr. betw Rio Grande City, Tex. & dam site	T 3,000	12.00	10.88
Unload & stor mat at RG City	T 1,000	7.00	6.35
Load mat from stor at RGC, trans to dam site	T 1,000	12.00	10.88

* a apply d drill f furnish i install
l load p place r remove

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *M. R. ROESSLER, Statistics*

WATER SUPPLY

BIDS ASKED

Fla., New Smyrna Beach—B.A. 12/29—City, treatment plant, 500,000 gal. concrete reservoir, wells, distr. lines, etc. Russell & Axon, Box 1431, Daytona Beach, engrs. CD 8/12/49.

LOW BIDDERS

D. C., Wash.—Dpt. Sanitation Dist. Comrs., District Bldg., rejected bids Nov. 30, general installation and construction Bryant St. Pumping Station, Bryant St. between 2 and 4 Sts. N.W., L.B. Bid 10-A $688,300 and Bid 10-B $718,300. CD 12/6, under LB.

Tex., Corpus Christi—Nueces County Water Control & Imprvt. Dist. 2, 102 Davis Dr. Flour Bluff Route, Dec. 1, Flour Bluff Water distr. sys., from Heldenfels Bros., Box 1917. $621,452. CD 11/14.

CONTRACTS AWARDED

Que., Amos—Municipality, L. Parent, secy., laying approx. 30,000 ft. 8 in. water mains, day labor, $150,000. P. Warren, 58½ de la Fabrique St., Quebec City, engr. CD 5/8/47.

SEWERS, WASTE DISPOSAL

BIDS ASKED

Kan., McPherson—B.A. 12/28—City, sanitary sewer exten. and lift station. Plans deposit $5. Wilson & Co., 223 N. Santa Fe St., Salina, engrs. CD 11/27.

Fla., Chipley—B.A. 12/29—City, sanitary sewer imprvs. Extended date. Smith & Gillespie, Box 1048, Jacksonville, engrs. CD 11/15.

Pa., Sunbury—B.A. 12/29—Municipal Auth., Sunbury, Sect. I, sewage interceptors and force mains, consisting 12- to 27-in. interceptors, manholes, etc. and 8- to 12-in. force mains, pipe and fittings for force mains will be furnished by authority; Sect. II, primary sewage treatment plant, incl. control bldg., separate sludge digestion tanks, primary clarifiers, detritor, pumping station, chlorine contact tank, sludge drying beds, plumbing, heating and electrical work. Plans deposit $15 for Sect. I, $25 for Sect. II. Ivan M. Glace, 1001 N. Front St., Harrisburg, consult. engr. CD 1/25/45.

O., Columbus—B.A. 12/31—City, Elmer A. Keller, Service Dir., Columbus, Meier St. District relief sewers $210,000; trunk sewers, Bliss Run Dist., $69,000: Orris Bonney, Engr. Div Sewers & Drains. CD 11/19/45.

CONTRACTS AWARDED

D. C., Wash.—Dist. of Columbia Dpt. Sanitation, District Bldg., sludge drying and incinerating equipment, Sewage Treatment Plan., Blue Plains, to Combustion Engineering-Superheater, Inc., 200 Madison Ave., New York, N. Y., $731,363. Bids 10/16, awarded 12/4. CD 11/13, under LB.

Miss., Tupelo—City, sanitary sewer imprvs., Sect. A, to M. & W. Constr. Co., Box 116, $255,956; Sect. B, to B & C—J. B. McCrary Corp., 22 Marietia St. Bldg., Atlanta, Ga., $488,016. Bids 12/1. CD 11/16.

O., Dayton—Comrs. Montgomery Co., Court House, sanitary sewer and water lines in Jaiappa Rd. and vicinity; sewer along Trails End Dr., south of Stroop Rd., to Burch Const. Co., Neff Rd., $100,689. Bids 11/30, awarded 12/5. CD 11/15.

Tex., Nixon—City, sanitary sewers, own forces. $66,000. CD 1/30.

BRIDGES

BIDS ASKED

▲ **B. C., Vancouver**—B.A. 2/19—Ronald Thompson, city clk., City Hall, initial section of Granville Street Bridge, about 1,773 ft. long between centers of piers, about 103 ft. wide, 397.5 ft. channel anchor span with two 125 ft. cantilever arms, two 250 ft. suspended spans, one 94 ft. anchor span with two 52.5 foot cantilever arms, two 157.5 ft. suspended spans, one 100 ft. simple span, all structural steel piers, decks will be rein.-con. and foundations, steel and wood piling, $5,000,000. Plans deposit $500. Maj. J. R. Grant, c/o J. C. Oliver, City Hall, engr. CD 2/23/49.

LOW BIDDERS

Louisiana—State Hy. Dpt., Baton Rouge, Nov. 29, 3 rein.-con. box culverts, 4 concrete slab span bridges, grading, c. conc. pavement 0.229 mi. approaches on Winnfield-Jackson Parish Line Hy., State Rte. 5, Proj. 23-05-08, Winn Parish, from Newsom Bros. & J. W. Snowden, Box 607, Columbia, Miss., $189,549. CD 10/31.

Maine—State Hy. Comn., Augusta, Dec. 6, Contr. 1, substructure Aroostook River Bridge in Caribou, F.A. Secondary Proj. S 0331 (1), Aroostook Co., from Forest Frederick, Pittsfield, $121,515; Contr. 2, steel superstructure, from Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh, Pa., $379,430. CD 11/15.

STREETS AND ROADS

LOW BIDDERS

▲ **Alabama**—State Hy. Dpt., Montgomery, Dec. 1, from Vandigriff Constr. Co., 4708 N. Court St., Montgomery, bit. surf. 4.619 mi. from Ala. 5 northwest to Maringo Co. line, Wilcox Co.; $86,597***bit. surf. 2.366 mi. Co. road between Gadsden and Whartons Bend, Etowah Co., $89,878***bit. surf. 6.029 mi. on county road from Black and east to Lee's Cross Roads, Geneva, $92,898***from Carlton Constr. Co., Albany, bit. surf., plant mix and bridge widn. Boaz-Guntersville Rd., Marshall Co., $505,881*** from Georgia-Alabama Road Constr. Co., Comer Bldg., Birmingham, double surf. tr. 12.523 mi. road from Faulkville thru Eva to Cullman Co. line, Morgan Co., $242,524***from Blount Bros. Constr. Co., Tuskegee, grading, drainage 4.374 mi. from Atwood toward Red Bay, Franklin Co., $94,144; bit. surf. 9.855 mi. Geneva-Bellwood Rd., Geneva Co., $153,109. CD 11/16.

Louisiana—State Hy. Dpt., Baton Rouge, Nov. 29, grading, rein. con. deck girder bridge, grav. base course, or alternate soil cement base course or crushed stone base course, 3 application bit. surf. (asph. cement) 6.083 mi. Bienville-Bryceland Hy., State Rte. 12, Proj. 89-04-09, F. A. Secondary Proj. S 87 (2), Bienville Parish, from T. L. James & Co., Inc., Ruston, $253,516***grav. base course or alternate soil cement base course, bit. surf. tr. (asph. cement) 7.129 mi. Nebo School-Jena Hy., State Rte. 57 and C2184, Proj. 830-15-02, 149-04-05 and 149-05-08, LaSalle Parish, from Henry & Hull, Dubach, $124,798 ***shaping shoulders aggregate type base course, bit. surf. tr. (asph. cement) 5.15 mi. Behrman Rd., State Rte. 31, Proj. 410-01-06 and 410-02-05, Orleans and Jefferson Parishes, from LeBlanc Brothers, 702 Louisiana National Bank Bldg., Baton Rouge, $142,660. CD 11/10.

▲ **Pennsylvania**—State Hy. Dpt., Harrisburg, Dec. 8, Schedule 1, c. conc. pavement 33 and 44 ft. and variable in width incl. construction rein.-con. box, divided highway, consisting of two 2 ft. lanes of c. conc. pavement on each side of a c. conc. divisor, grading 88 ft. and variable in width; Schedule 2, continuous deck steel truss and I-beam bridge and concrete deck continuous I-beam bridge, incl. channel change and concrete deck I-beam bridge; Schedule 3, construct project as a whole, 20,377 ft. L. R. 68 (12-8) (R-6A), (R-6C); 32004 (R-3); 902 (R-2), T. R. 22 and 680 in vicinity of Blairsville, also east and west of Blairsville, Westmoreland and Indiana Counties, from Latrobe Road Constr., Inc., P. O. Box 150, Latrobe, $2,801,332. CD 11/3.

▲ **Pennsylvania**—State Hy. & Bridge Auth., 506 N. Office Bldg., Harrisburg, Dec. 8, construct divided hy. consisting of rein.-con. pavement 24 ft. wide on each side of a concrete divisor area 4 ft. wide and three concrete deck plate girder and I-beam viaducts; also for construction approach ramps consisting rein.-con. pavement 18 ft. and variable in width, rein.-con. retaining wall and one through plate girder viaduct, all within an over-all length of 1,716 ft., total length 2,763 ft. L. R. 765 (3B, 4B). T. R. 22, 30, a section of Penn-Lincoln Parkway, west, Allegheny Co., from Dinardo, Inc., 331 Bouquet St., Pittsburgh, $2,761,657. CD 11/9.

CONTRACTS AWARDED

▲ **Oklahoma**—State Hy. Dpt., Capitol, Oklahoma City, Zone 5, b. conc. 3.403 mi. four lane pavement U. S. 81, north of Enid, Garfield Co., to Earl W. Baker & Co., Bethany, $477,101, est. $480,391***grading, drainage, minor structures 0.737 mi. U. S. 66 near Luther, Oklahoma Co., and grading, drainage and 2 bridges 0.873 mi. U. S. 6 near Chandler, Lincoln Co., to J. A. Raines, Barnes Bldg., Muskogee, $125,685, est. $121,381 and $198,458, est. $198,194 respectively***b. conc. 1.007 mi. Hy. 33, east of Tulsa, Tulsa Co., to Layman & Sons, Riverside Dr., Tulsa, $163,163, est. $156,190***b. conc. 4.399 mi. U. S. 66, west of Sapulpa, Creek Co., to Standard Paving Co., 2119 E. 11 St., Tulsa, $304,228, est. $294,357***b. conc. 1.51 mi. U. S. 66 near Luther, Oklahoma Co., and b. conc. 4.683 mi. U. S 66, near Luther, Oklahoma Co., to W. E. Steelman, 2800 N. E. 4 St., Oklahoma City, Zone 4, $268,248, est. $297,681 and $600,278, est. $670,30 respectively*** b. conc. surf. 1.11 mi. U. S. 66, near Luther, Oklahoma Co., to Anchor Constr. Co., Barnes Bldg., Muskogee, $67,261, est. $74,853***b. conc. 5.425 mi. U. S. 66, west of Yukon, Canadian Co., to Brooks & Dahlgren, Insurance Bldg., Oklahoma City, Zone 2, $446,871, est. $540,569***grading, drainage, multiple box culvert 4.399 mi. U. S. 66, west of Sapulpa Creek Co., to M. E. Gillioz, Monett, Mo., $295,425, est. $311,277. Grand total $2,946,718. Bids 12/5, awarded 12/6. CD 11/28.

Pennsylvania—State Hy. Dpt., Harrisburg, 3.95 mi. construction between Nanticoke and Wilkes Barre, incl. rein.-con. 25 ft. and variable to 50 ft.; divided hy., c. conc. pavement 22 and 23 ft. wide on each side of concrete divisor area 2.5 ft. wide, widen. existing pavement with plain c. conc. base and bit. surf. new and existing base; 80 ft. steel beam floor I-beam bridge over Solomons Creek and a 28 ft. I-beam concrete bridge over Nanticoke Creek, Rural Route 40033, Hanover Twp., Luzerne Co., to B. G. Coon Constr. Co., 278 Union St., Luzerne, $845,315. Bids 11/22. CD 11/27, under LB.

▲ **Pennsylvania**—State Hy. Dpt., Harrisburg, c. conc. pavement 14 ft., 22 ft. and variable in width incl. exten. an existing structure 7 rein.-con. structures, one rein.-con. bridge, one plate girder bridge; construct divided highway consisting of c. conc. pavement 22 ft. on each side of a concrete divisor, construct 3 rein.-con. bridges and one I-beam bridge 31,294 ft. L. R. 187 (6E) 02134 (2); 02143 (2); 348 (5); 228 (15). T. R. 22, 80, 380, from point east of village of Mountville to point southwest of Camp Jo-Ann, Allegheny and Westmoreland Counties to Latrobe Road Constr. Inc., P. O. Box 150, Latrobe, $1,970,463. Bids 11/22, awarded 12/6. CD 11/27, under LB.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
B.A. Bids Asked
ENR Engineering News-Record
CD Engineering News-Record Construction Daily

EARTHWORK, WATERWAYS

LOW BIDDERS

† **Arizona-California-Nevada**—Bureau Reclamation, Dpt. Interior, Coachella, Calif., earthwork, pipe lines and structures Laterals 88.6,914 and 93.0 and Part 1 of Unit 9, Coachella Valley Distribution System, All American Canal System, Boulder Canyon Proj. in vicinity of Mecca, Spec. DS-3219, from R. V. Lloyd & Co., Box 391, Coachella, Calif., $520,735. Est. $625,199. CD 10/17.

New York—Dpt. P. Wks., Albany, Dec. 6, exten. approach wall (Waterford Dry Dock), Contr. M-99, Saratoga Co., from D. A. Collins, Mechanicville, $65,003. Est. $77,729. CD 11/22.

AIRPORTS

BIDS ASKED

† **Fla., Key West**—LINE MAINTENANCE BLDG., etc.—B.A. 1/5—Dpt. Navy, Charleston Naval Base, Charleston, S. C., line maintenance bldg. parking area and water lines, Naval Air Station, NOY 226333, Spec. 25226. Plans deposit $5. Extended date. CD 11/22.

CONTRACTS AWARDED

Ont., Camp Borden—TECHNICAL TRAINING—Canadian Commercial Corp., 70 Lyon St., Ottawa, 2 story, 186x319x85 ft., concrete, structural steel, brick, U-shaped technical training bldg. for Royal Canadian Air Force, to A. W. Robertson Ltd., 57 Bloor St. W., Toronto. Bids 9/13, awarded 12/5. Marani & Morris, 1250 Bay St., Toronto, archts. CD 8/24.

(Continued on page 64)

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Slipseal Sewer Joint	Drain Tile	Fire Brick
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(Continued from page 62)

PUBLIC BUILDINGS

BIDS ASKED

Pa., Laurelton—COTTAGES—B.A. 12/28—General State Auth., 18 and Herr Sts., Harrisburg, general contract, heating, plumbing, electrical work for cottage for quiet girls and security type cottage at Laurelton State Village. $700,000. Plans deposit $10 each. George S. Idell, 117 S. 17 St., Phila., Zone 3, archt. A. F. Jones, c/o owner, ch. engr. CD 9/13, under LB.

Pa., Millersville—DORMITORY—B.A. 12/28—General State Auth., 18 and Herr Sts., Harrisburg, general contract, heating, plumbing, electrical work men's dormitory at Millersville State Teachers College. $480,000. Plans deposit $10 each. H. Clifford Kreisle, 20½ N. Queen St., Lancaster, archt. A. F. Jones, c/o owner, ch. engr. CD 12/20/49.

Pa., Phila.—BOILER PLANT—B.A. 12/28—General State Auth., 18 and Herr Sts., Harrisburg, general contract, heating, electrical work for boiler plant in connection with Eastern Pennsylvania Psychiatric Institute, Henry Ave. and Abbottsford Rd. $640,000. Plans deposit $10 each. Harbeson, Hough, Livingston and Larson & Harry Sternfeld, 404 Architects Bldg., Zone 3, archts. A. F. Jones, c/o owner, ch. engr. CD 5/26.

Mich., Muskegon Heights—SCHOOL—B.A. 1/4—Bd. Educ., S.E. Strand, secy., 2 story, bsmnt., brick, concrete school, $300,000. Plans deposit $25. Warren S. Holmes Co., 2200 Olds Bldg., Lansing, archts.

† **S. C., Charleston**—COLD STORAGE ROOM and REFRIGERATOR PLANT—B.A. 1/4—Dpt. Navy, Bureau Yards & Docks, Charleston, addnl. refrigeration zero cold storage room and refrigerator plant at Naval Base, NOY 23207, Spec. 25622. Plans deposit $10.

Calif., Oroville—SCHOOL—B.A. 1/16—Oroville Union High School Dist., Oroville, 1 story, rein.-con., steel gymnasium at Oroville Union High School. Plans deposit $25. Former contract rescinded. E. Geoffrey Bangs, 605 Market St., San Francisco, archt. CD 10/27, under LB.

O., Twinsburg—SCHOOL—B.A. 1/18—Bd. Educ., M. L. Zahniser, clk-treas., State Routes 91 and 82, Twinsburg, Twinsburg School addn., alterations. Plans deposit $20 general, $15 each, heating, plumbing, electrical. Fulton, Krinsky & Dela Motte, 6014 Euclid St., Cleveland, archts. CD 10/12.

LOW BIDDERS

▲ **Ind., Indianapolis**—HIGH SCHOOL—Bd. Educ., Perry Twp., Indianapolis, cancelled bids to have been opened Dec. 5, brick, stone Junior High School, Banta Ave., near Shelby St. $1,000,000. May readvertise in January. CD 10/25.

N. J., Scotch Plains—SCHOOL—Scotch Plains School Dist., Evergreen School on 19-acre tract off Evergreen Ave., from Wilson Bros. Builders Inc., North Plainfield, $339,000. CD 11/16.

Pa., Woodville—PATIENTS—General State Auth., 18 and Herr Sts., Harrisburg, Dec. 6, general contract disturbed male patients bldg. at Woodville State Hospital, from Clement Martin, Inc., 6230 Penna Ave., Pittsburgh, $598,793. Ingram, Boyd & Pratt, Empire Bldg., Pittsburgh, Zone 22, archts. A. F. Jones, c/o owner, ch. engr.

Tex., Austin—POLICE HEADQUARTERS—State of Texas, Public Safety Comn., c/o Allen Shivers, gov., Capitol Bldg., Dec. 5, state police headquarters, from Leslie F. Crockett Constr. Co., 112 Academy Dr., base bid, $562,000. CD 11/9.

▲ **Va., Roanoke**—HOUSING—Roancke Development & Housing Auth., 401 Luck Ave. S.W., Dec. 5, low rent public housing, 350 unit development, from Goode Constr. Corp., Builders Bldg., Charlotte, N. C. $3,066,000. CD 11/14.

CONTRACTS AWARDED

Calif., Los Angeles—COMPENSATION INSURANCE FUND—State Div. Architecture, P. Wks. Bldg., Sacramento, general contract 3 story, 53,800 sq. ft., rein.-con. Compensation Insurance Fund bldg., to C. W. Driver Inc., 3416½ W. 1 St., $617,400. Bids 11/21. CD 11/29, under LB.

Ia., Bettendorf—SCHOOL—Bd. Educ., Walter B. Eriksen, supt. Schools, brick, concrete, etc. Junior High School, to C. H. Langman & Sons, Bettendorf, approx. $500,000.

Mass., Everett—HOUSING—City of Everett Housing Auth., Albert E. Morris, exec. dir., 48 Elm St., fifteen 2½ story, bsmnt., 60 unit veteran's bldgs., to Concrete Constr. Co., 11 Garfield Ave., Boston, $507,700. Bids 11/29. CD 11/6.

Pa., Millersville—DORMITORY, etc.—General State Auth., 18 and Herr Sts., Harrisburg, general contract women's dormitory and dining hall at Millersville State Teachers' College, to Herman Wohlsen's Sons, 705 Griest Bldg., Lancaster, $526,370. CD 12/4, under LB.

Va., Falls Church—HIGH SCHOOL—Falls Church School Bd., 1057 W. Broad St., 1 story brick, steel Junior-Senior High School, Leesburg Pike and Haycock Rd., to B & J Constr. Co., 3432 Connecticut Ave., N.W., Wash., D. C., $680,952. Est. $600,000. Bids 11/29, awarded 11/30. CD 12/7, under LB.

COMMERCIAL BUILDINGS

BIDS ASKED

Ill., Chicago—STORE—Bids Asked—Sears, Roebuck & Co., Homan and Arthington Sts., Zone 24, store, State

and 112 Sts. $350,000. Carr & Wright, 80 E. Jackson St., Zone 4, archts.

SOON LETS CONTRACT

Ky., Lexington—DEPARTMENT STORE—Chas. H. Manning Estate, c/o Stewart Dry Goods, lessee, 501 S. 4 St., Louisville, soon lets contract, department store remodeling, addn. $600,000. Gillig Watkins & Assoc., 145 E. High St., archts. E. R. Ronald & Assoc., 554 S. Third St., Louisville, engrs. CD 6/30.

La., Alexandria—MEDICAL CENTER—At office Barron, Heinberg & Brocato, archts., 512 Guaranty Bank Bldg., soon lets contract, Alexandria Medical Center at Jackson, 13 and Holly Sts. $300,000, for Jackson Street Corp., Alexandria. CD 8/24.

Mo., Affton (St. Louis 23, P.O.)—SHOPPING CENTER—Business Properties, Inc., (Fred P. Rapp Super Market Stores), Fred P. Rapp, 1450 S. Vanderventer Ave., 6610 Clayton Ave., St. Louis., Zone 10, soon let's contract 1 story, 105x200 ft., brick, steel, concrete, tile super market bldg., 1 story, 50x164 ft. bldg. containing 6 stores for shopping center, 8400 Gravois Rd. Peter T. Siebke, 4719 Farlin Ave., St. Louis, Zone 15, archt. CD 9/11.

CONTRACTS AWARDED

Calif., Hayward—RESIDENCES—Groom Development Co., 8400 MacArthur Blvd., Oakland, 45 residences, on Ragland and Johnson Sts., and Westerman Court. Owner builds. $302,400.

Fla., Jacksonville—HOMES—H. S. Brownett Co., 578 Margaret St., 48 family homes, Longwood Rd. off Saint Jose Blvd. Owner builds. $325,000.

▲ **Ill., Chicago**—APARTMENT—Alfred B. Perlman, c/o Shaw, Metz & Dolio, archts., 208 S. LaSalle St., Zone 4, 18 story, 221 unit apartment, to Crane Constr. Co., 505 N. Michigan Ave., Zone 11. Approx. $2,100,000. CD 8/16.

▲ **Ky., Lexington**—HOTEL—S. S. Ruttenberg & Assoc., 135 LaSalle St., Chicago 3, Ill., 6 story, rein.-con., stone, brick hotel and 3 story office, to Geo. A. Fuller Co., 111 W. Washington St., Chicago 2, Ill., $1,750,000. Bids 9/11, awarded 11/30. Holabird, Root & Burgee, 185 N. Wabash St., Chicago 1, Ill., archts. CD 9/19.

Mich., Allen Park—HOUSING—Barnett Bldg. Co., c/o Glenn Mills, 16104 Ecorse St., 40 or more brick, frame homes. Owner builds. $400,000.

Mich., Allen Park—HOUSING—First Detroit Bldg. Co., 16752 Ecorse St., 55 brick single houses. Owner builds. $550,000.

Mich., Allen Park—HOMES—Julius Green, 18263 Hartwell St., Detroit, 56 half brick frame homes, Melbourne, Myers and Chatham Sts. Owner builds. $600,000.

Mich., Warren—HOUSING—Graddis Constr. Corp., 11068 Studebaker Ave., 44 single family homes, Studebaker Ave. Owner builds. $300,000.

O., Columbus—APARTMENTS—North-West Apartments, Inc., 1036 Chambers Rd., 12 unit brick apartments, 5 four unit buildings, six 6-unit bldgs., two 13-car garages, to Mack-Stewart Corp., 1036 Chambers Rd. Approx. $402,000.

Tex., Houston—DWELLINGS—Lynwood Corp., c/o W. C. Bond, 213 Georgia St., 65 addn'l. dwellings, in sect. of McGregor Terrace. Owner builds. Approx. $475,000. CD 12/1.

Tex., Houston—DWELLINGS—John Taub, 3834 Wichita St., 50 dwellings, various streets. Owner builds. $362,000. CD 11/3.

Tex., San Antonio—DWELLINGS—Bremer & Wilhelm, 3031 Culebra Rd., 61 addnl. dwellings. Owner builds. $420,000. CD 11/24.

Tex., San Antonio—DWELLINGS—H. P. Orts Constr. Co., 814 Gunter Bldg., 48 dwelling units in area off Brookhaven sub-division. Owner builders. Approx. $300,000. CD 11/2.

Ont., Toronto—STORE—Saracini Constr. Co., 158 Government Rd., 15 brick, concrete block stores, Burnamthorpe Rd., Etobicoke Twp. Owner builds. $300,000. Hanks & Irwin, 2848 Bloor St. W., archts.

INDUSTRIAL BUILDINGS

BIDS ASKED

Tex., Beaumont—PLANT—B.A. 1/4—Beaumont Enterprise Journal Publishing Co., 380 Walnut St., 3 story, brick, terra cotta printing plant addn., rein.-con. piers, grade beams, columns and drilled footings fdn. $150,000. Plans deposit $25. W. P. Moore, 4605 Montrose St., and Howard & Johnson, Scanlan Bldg., Houston, engrs. Golemon & Rolfe, 203 Bowie Bldg., archts. CD 9/23/49.

Conn., New Haven—FACTORY—Bids Asked—Harry S. Cannici, archt., 113 First Ave., West Haven, factory alterations, changes to be made to Bldgs. 3, 13, 21, 45 and 25, and new plans for office, for New Haven Clock & Watch Co., 133 Hamilton St.

Conn., West Haven—FACTORY—Bids Asked—Rubbercraft Corp. of America, 151 Orange St., New Haven, 128x197 ft., brick, steel factory addn., concrete floors. Harry S. Cannici, 113 First Ave., archt.

Ill., Chicago—WAREHOUSE—Bids Asked—Chicago Metal Mfg. 3724 S. Rockwell St., 1 story, 163x249 ft., brick, steel warehouse. Shantz & Pechota, 25 E. Jackson St., archts.

SOON LETS CONTRACT

▲ **Ky., Louisville**—WAREHOUSE, etc.—Philip Morris & Co., Ltd., Inc., 1930 Maple St., soon lets contract 7 story, rein.-con., 110x150 ft. warehouse and office, $3,000,000. Lockwood Greene Engineers, Inc., 10 Rockefeller Plaza, New York, N. Y., engr. 11/27.

Mo., Maplewood (St. Louis 17, P.O.)—FACTORY—Sporian Valve Co., 7525 Sussex Ave., Zone 17, soon lets contract, 2 story, 41x47 ft., brick, steel valve factory, loading dock with canopy addn., Greenwood Blvd. and Sussex Ave., Wischmeyer & Lorenz, 911 Locust St., St. Louis, Zone 1, archts.

Tex., Bertram—WAREHOUSE—Pedernales Electric Cooperative, Bertram, soon lets contract, warehouse. $90,000.

Tex., Houston—SHOP AND SERVICE—The H. C. House Estate, Union Natl. Bank Bldg., soon lets contract, 120x155 ft. structural steel, hollow tile, stone auto shop, service, rein.-con. footings grade beam and slab fdn. $90,000.

Ont., Leaside—FACTORY—Canada Wire & Cable Co. Ltd., 147 Laird Dr. N., soon lets contract, 1 story 82,000 sq. ft., steel, brick factory, existing plant addn. $305,000.

Ont., Sudbury—WAREHOUSE, etc.—Cochrane Dunlop Hardward Ltd., 23 Dunham St., soon lets contract 2 story, 180x263 ft., concrete, steel warehouse and office. J. B. Sutton, 81 Lorne St., archt.

CONTRACTS AWARDED

Ill., Niles—FACTORY—Lighthouse Trailer Co., 5767 W. Touhy St., 60,000 sq. ft., steel, brick factory, to Klefstad Eng. Co., 3450 Kostner Ave., Chicago, Zone 41, $450,000. Awarded 12/1.

▲ **Ind., New Castle**—FACTORY, etc.—Chrysler Corp., 17 and I Aves., general contract 80x525 ft. factory forge room, 48 ft. high, and 50x300 ft. die shop, to Wermuth Corp., 1036 St. Marys St., Fort Wayne. Est. approx. $1,000,000. Awarded 12/4. CD 10/2.

Ky., Louisville—LABORATORY—American Radiator & Standard Sanitary Corp., 1541 S. 7 St., general contract remodel and construct addn. to present bldg. for plumbing and heating laboratory, Campbell and Broadway Sts., to Sullivan & Cozzart, 8 and Kentucky Sts., $275,000. Bids 11/30, awarded 12/4. CD 11/21.

O., Toledo—FACTORY—Glass Fibers, Inc., 6050 River Rd., 2 story wing brick, concrete factory, incl. new front, shipping traffic offices, 7 truck docks, etc., to Paul C. Peters Co., 2318 Monroe St., Approx. $243,000. Bellman, Gillett & Richards, 518 Jefferson St., archts.

▲ **Tex., Corpus Christi**—REFINERY—Taylor Refining Co., Taylor, modernizing, expanding refinery, near here, own forces, under supervision Socony-Vacuum Oil Co., Inc., Eng. Dpt., 26 Broadway, New York, N. Y., $1,400,000. CD 11/15.

Tex., Fort Worth—WAREHOUSE—Fort Worth Wholesale Merchandise Co., 5200 Bryce St., 250x400 ft. warehouse and office, 300 W. Vickery St., to Elmer Wooldridge, 4108 Lovell St., $190,000. C. M. Davis, Dan Waggoner Bldg., engr. CD 11/27.

Tex., Houston—WAREHOUSE—S. N. & J. S. Adams, 4001 Westheimer St., warehouse, near S. P. Ry. tracks and Highland Village, own forces. Approx. $85,000. CD 11/29.

Tex., Houston—PLANT—Martin Poultry & Egg Co., 4906 Canal St., poultry and egg plant, own forces. Approx. $85,000. CD 11/14.

Tex., Rio Vista—PLANT—Rio Vista Co-op. Gin Co., Rio Vista, reconstruct cotton gin plant, own forces. Approx. $85,000.

B. C., Burnaby—FACTORY, etc.—Tru-Fit Millwork (B.C.) Ltd., 2950 Beresford St., 1 story, concrete block factory and warehouse. Owner builds. $140,000. Awarded 11/29. Jack Kenney, c/o 2950 Beresford St., engr.

Ont., Toronto—PLANT—Diamond State Fibre Co-operative of Canada Ltd., 356 Eastern Ave., 1 story, steel, brick plant, Hollinger Rd., East York, to Finley W. McLachlan Ltd., 195 Fairbank Ave., Approx. $225,000. C. G. McLean, 620 King St. W., archt.

UNCLASSIFIED

BIDS ASKED

N. Y., New York — OUT-DOOR SUB-STATIONS — B.A. 12/27—Bd. Water Supply, 120 Wall St., Zone 7, furnishing, testing, del. 2 outdoor unit sub-stations, each having 150 kva. capacity at 60 cycles, 3 phase and approx. 300 ft. 3 kv electric cable, 3-conductor, No. 6. Plans deposit $5. CD 1/27, under Water Supply.

N. Y., New York—BLOCK SIGNALING EQUIPMENT, etc.—B.A. 12/29—Bd. Transportation, 250 Hudson St., Zone 13, furnishing, del. block signaling and interlocking equip. for Third Avenue Line signaling, local tracks, 149 to 219 Sts. and Track M, Fordham to Gun Hill Rds., Bronx Boro.

California—TRAFFIC LIGHTING, etc.—B.A. 1/3—State Div. Hys., P. Wks. Bldg., Sacramento, traffic lighting and signal systems and channelization Eaststore Highway and University Ave., Central Ave., and Carlson Blvd., Berkeley, Alameda Co., and Richmond Contra Costa Co. G. T. McCoy, Sacramento, state hy. engr.

California—HIGHWAY LIGHTING SYSTEM—B.A. 1/4—State Div. Hys., 120 Spring St., Los Angeles, highway lighting sys. at El Cajon Blvd. and 56 St., etc., San Diego, San Diego Co. G. T. McCoy, Sacramento, state hy. engr.

Calif., Napa—EXHIBIT—B.A. 1/9—State Div. Architecture, P. Wks. Bldg., Sacramento, exhibit bldg. and floriculture bldg., for 25th Distr. Agriculture Assn., Plans deposit $25. Anson Boyd, Sacramento, state archt. CD 1/2/B, under LB.

SOON LETS CONTRACT

La., Harvey—WHARF—Gulf Refining Co., Box 2100, Houston, Tex., soon lets contract 20x128 ft. timber wharf and 348 lin. ft. timber sheet piling bulkhead walls.

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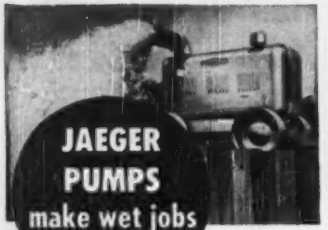

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CONTRACTS AWARDED

Arizona — RURAL DISTRIBUTION LINES — Navopache Electric Co-operative, Inc., Lakeside, 27 mi. rural distr. line and 30 mi. 69 kv single circuit transmission line, Navajo Co., to Walsh Constr. Corp., Sherman, Tex., $91,767. Tynes & Loftin, 512 Heard Bldg., Phoenix, engrs.

Colorado—RURAL DISTRIBUTION LINES—Highline Electric Assoc., Inc., Holyoke, 347 mi. rural distr. lines and sys imprvs., Phillips Co., to Jillie & Cannon, Wakeeney, Kan., labor $88,744, materials $347,000, total $435,744. Miner & Miner, 1825 Tenth Ave., Greeley, engrs. CD 5/31.

Iowa — RURAL DISTRIBUTION LINES — Greene County Rural Electric Co-operative, Jefferson, 13.9 mi. rural distr. lines and sys. imprv., Greene Co., to Ferguson-Diehl Constr. Co., Jefferson, $110,382. CD 6/30.

Iowa—RURAL DISTRIBUTION LINES—Southern Iowa Electric Co-operative, Bloomfield, 208.6 mi. rural distr. line and sys. imprvs., Davis Co., to Superior Elec. Co., Appleton, Wis., $402,155. Stanley Eng. Co., Muscatine, engr. CD 11/18/48.

Minnesota—RURAL DISTRIBUTION LINES—Wild Rice Electric Co-operative, Mahnomen, 253 mi. rural distr. lines in Polk, Norman, Mahnomen, Clay and Becker Counties, to Swift Electric Co., Wheaton, $339,122. CD 9/22.

▲ **N. Y., New York**—TUNNEL—President Manhattan Boro, Municipal Bldg., Zone 17, tunnel complete with ramp approaches in 1st Ave. between E. 41 and E. 48 Sts., incl. regrading and final restoration 1st Ave. between E. 40 and E. 49 Sts., etc. vicinity of United Nations site, with ramp approaches, etc. between E. 40 and E. 49 Sts., to Del Balso Constr. Co., 500 Zerega Ave., Bronx 61, $3,988,426. Bids 11/17. CD 11/24, under LB.

Texas — TELEPHONE LINES — Southwestern Associated Telephone Co., Memphis, new and rebuilding toll circuits and lines, Dodson, Collingsworth Co., force account. $145,000. CD 11/27.

Tex., San Antonio — UNDERGROUND CABLES — Southwestern Bell Telephone Co., c/o Auditorium Circle, addnl. unit of underground cables, force account. $200,000. CD 10/25.

PROPOSED PROJECTS

WATER SUPPLY

Ky., Lancaster—City, dam, elevated tank, settling basins, pump house and wells. $140,000. J. S. Watkins, 145 E. High St., Lexington, consult. engr.

▲ **Mont., Miles City**—City, City Hall, voted bonds water reservoir and new mains circling city. $1,390,000. Burns & McDonnell, 95 and Troost Sts., Kansas City, Mo., consult. engrs. CD 9/20.

SEWERS, WASTE DISPOSAL

Calif., Walnut Creek—Central Contra Costa Sanitary Dist., 1822 Mt. Diablo Blvd., sanitary sewers in Sleepy Hollow area in Orinda, $279,000. John L. Mason, Walnut Creek, c/o owner, ch. engr.

Colo., Boulder—City, City Hall, plans by Phillips, Carter, Osborn Inc., archt. and engr., Insurance Bldg., Denver, sewage treatment plant, $308,000.

Ky., Carrollton—City, sewage disposal plant, exten. present sewerage sys. $305,817. J. S. Watkins, 145 High St., Lexington, and Robert Martin, Heyburn Bldg., Louisville, consult. engrs. CD 6/27.

Md., Middletown—City, sanitary sewage treatment plant and sys. $340,000.

N. J., Neptune City—City, Steiner Ave. drainage project. $180,000. Claude W. Birdsall, 1700 F. St., Belmar, engr. CD 12/20/45.

▲ **N. C., Raleigh**—City, bond election Jan. 27, enlarging, reconstructing city surface drainage sewerage sys., $500,000; sewage purification plant, $1,347,000. CD 5/27/49.

Pa., Point Marion—Point Marion Boro, Boro Hall, sewers, pump station and treatment. $250,000. Gannett, Fleming, Corddry & Carpenter, Inc., 600 N 2nd St., Harrisburg, engr.

Pa., Smethport—Smethport Boro, Boro Hall, sewers, pumping station and treatment plant. $250,000. Gannett, Fleming, Corddry & Carpenter, Inc., 600 N 2nd St., Harrisburg, engr. CD 4/20/45.

Pa., Whitaker—Whitaker Municipal Auth., Whitaker, sewage disposal plant facilities for 3,000. $200,000. Morris Knowles, 1312 Park Bldg., Pittsburgh, engr. CD 5/29/46.

Tex., Gainesville—City, voted bonds, sanitary sewer collection lines (separate unit). $100,000. Wyatt C. Hedrick, 904 Fort Worth Ave., Dallas, consult. engr. CD 11/17.

Tex., Robstown—City, sewage disposal plant and sys. $425,000. Sigler, Clark & Winston, Box 428, Weslaco, consult. engrs. for disposal plant. CD 9/19.

▲ **Tex., San Angelo**—City, voted bonds, sanitary sewer lines, $550,000; sewage disposal plant, $250,000; storm sewers, $200,000. Freese & Nichols, 407 Danciger Bldg., Fort Worth, consult. engrs. CD 11/15.

BRIDGES

Can., Lindsay—Municipality, subway under C. N. R.R. tracks. $150,000. R. C. Mitchell, City Hall, city engr.

STREETS AND ROADS

Ill., Rock Island—Rock Island Co., Rock Island, grading, surf. 8 mi. Andalusia Rd. south through Edgington to county line. $190,000.

▲ **Mo., Kansas City**—Jackson Co., David W. Leonard, co. hy. engr., Court House, paving, bridge, etc., 2 projects for Fort Osage Twp., $122,000; paving, etc., 3 projects for Brookings Twp., $60,000; paving roads, 4 projects for Prairie Twp., $104,000; asph. resurf. 6 projects for Soni-a-Bar Twp., $156,000; conc. paving, bridge, etc. 8 projects for Washington Twp., $444,500; wid'n, resurf. various roads, 9 projects Blue Twp., $214,000.

Neb., Omaha—City, City Hall, 18 and Farnam Sts., defeated $100,000 bonds, paving parking areas. E. W. Woodbridge, city engr. CD 9/25.

▲ **Neb., Omaha**—City, City Hall, 18 and Farnam Sts., defeated $1,250,000 bonds, arterial highway (streets). E. W. Woodbridge, city engr. CD 10/13.

N. C., Raleigh—City, bond election Jan. 25, street imprvs. $750,000.

▲ **Oklahoma**—State Hy. Dpt., Capitol, Oklahoma City, Zone 5,

Leflore Co.—14 mi. cut off route U.S. 59 across Quachita Forest between Stapp and Big Cedar. $1,100,000. S. K. McClelland, c/o owner, engr.

Tex., New Braunfels—City, voted bonds, street paving program. $225,000. CD 11/16.

Tex., San Angelo—City, voted bonds, street imprvs. and paving. $175,000. Freese & Nichols, 407 Danciger Bldg., Fort Worth, consult. engrs. CD 11/15.

▲ **Ontario**—Dpt. Hys., Toronto (Dom. Govt.), first 10 mi. super-highway to link Windsor with Toronto, dual highway will have overpasses and each of its two lanes 22 ft. wide, 30 ft. boulevard in centre, incl. shoulders, right-of-way 108 ft. wide and new road from Bowmanville to Newcastle, Approx. $150,000,000.

EARTHWORK, WATERWAYS

▲† **Colorado**—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, constr. Willow Creek Pumping Plant and Willow Creek Pump Canal, Colorado-Big Thompson Proj., approx. 4 mi. of Granby, Spec. 245-D-5776. Prospective bidders wishing to visit the site are advised to contact U. V. Engstrom, construction engineer, Bureau Reclamation, Grand Lake, Colo.

LATIN AMERICA

British Guiana, Georgetown—Govt. of British Guiana, Georgetown, plans five point coastal drainage project areas, Demerara-Essequabe, Demerara-Mahaicony, Mahaicony-Barbica-Barbica-Corentyne, $43,000,000.

British Guiana, New Amsterdam—Govt. of British Guiana, Georgetown, plans harbor imprvs. $3,840,000.

Mexico, Ciudad Madero—Mexican Govt., Srla. de R. H., P. la Reforma, 69, Mexico City, plans sewerage. $1,750,000. CD 7/29/46.

Mexico, Mexico City—Emilio Sevilla Perez, Allende, 138, Mexico City, plans iron pipes factory. $150,000.

Mexico, Mexico City—Proyectores de Mexico, S.A., Av. Ferrocarril, 212, Col. Moctezuma, Mexico City, plans 16 mm. movie projectors factory. $250,000.

PUBLIC BUILDINGS

▲ **Calif., Arcadia**—SCHOOL—Arcadia School Dist., 1000 El Monte Blvd., $1,950,000 bond election Jan. 29, high school. CD 8/27/45.

Calif., Bakersfield—SCHOOL—Bakersfield City School Dist., 1600 K St., plans by C. B. Alford, Haberfeld Bldg., Junior High School, Center and Oswell Sts. $650,000. CD 4/7.

Calif., Bakersfield—SCHOOL—Lerdo Elementary School Dist., Rt. 1, plans by Wright, Metcalf & Parsons, Morgan Bldg., school. $532,488.

▲ **Calif., Chico**—SCHOOLS—Chico High School and Elementary School Districts, Chico, voted $1,170,000 bonds, 23-classroom Junior High School, etc. $3,610,000. Thomson & Evans, 1308 E. 38 St., Oakland, archts.

▲ **Calif., Fresno**—SCHOOLS—Fresno City Unified School Dist., Fresno, plans by Swartz & Hyberg, Rowell Bldg., Sequoia Junior High School, $1,189,815; plans by Walter Wagner, 1830 Van Ness Ave., frame, stucco Frank A. Homan School, $370,000. CD 7/13.

▲ **Calif., Fresno**—HOSPITAL—Fresno Co., Court House, plans by David D. Horn & Marshall Mortland, 1244 O St., 300-bed rein.-con. tuberculosis hospital. $2,760,000.

Calif., Richmond—OFFICE—Contra Costa Co., Court House, plans by Donald L. Hardison, 522 23 St., county office, $800,000. CD 6/21/48.

▲ **Idaho, Boise**—SCHOOLS—School Bd., Boise, voted bonds, Junior High School, $785,000, elementary school, $250,000. CD 11/16.

▲ **Ill., Round Lake**—SCHOOL—Grant Community High School Bd., Round Lake, Grant Community High School adn., $1,200,000.

Ia., Sioux City—SCHOOL—Bd. Educ., Junior-Senior High School. $500,000.

† **Ky., Fort Campbell**—BARRACKS—U. S. Eng., Ft. Campbell, rehabilitation 20 sections barracks. **$560,000.**

Md., Baltimore—COLLEGE—State, Dpt. P. Imprvts., 506 Park Ave., Zone 2, Coppin State Teachers College, (colored) incl. science laboratory, library, etc., near here. **$862,500.** John B. Funk, 506 Park Ave., Zone 2, ch. engr.

▲ **Md., Sykesville**—HOSPITAL—State, Dpt. P. Imprvts., 506 Park Ave., Baltimore, Zone 1, 2 women's and 2 men's masonry patients bldgs., $2,000,000; brick, block employees dormitory, $505,000; 1 story, masonry auditorium and recreation bldg., $456,000; 40,744 sq. ft. kitchen and general storeroom, $709,291; roads, streets and utility extens., $375,000, for Springfield State Hospital, John B. Funk, 506 Park Ave., Baltimore, Zone 1, ch. engr.

▲ **Md., Towson**—COLLEGE—State, Dpt. P. Imprvts., 506 Park Ave., Baltimore, Zone 1, demonstration school, $600,000; library, $625,000; service bldg. $98,000; physical educ. plant addn., $522,300; dramatic arts bldg., $450,000; remodel dining room for Student Union Hall and altering administration bldg., $250,000; brick, block, concrete, steel girls dormitory, $382,000; roads, walks, lighting sys. and imprvs., $100,000, for Towson State Teachers College, John B. Funk, 506 Park Ave., Baltimore, Zone 1, ch. engr.

Mass., Boston—SCHOOL—City of Boston, Dpt. School Bldgs., 26 Norman St., plans by Thomas F. McDonough, 25 Huntington St., school, Elihu Greenwood Dist., Hyde Park. **$650,000.**

Mass., Reading—SCHOOL—Town, Supt. Schools, plans by Adden, Parker, Cinch & Crimp, 177 State St., Boston, high school. **$750,000.** CD 9/6/47.

Mich., Flat Rock—SCHOOL—Bd. Educ., Flat Rock, plans by G. Arntzen, 820 S. 16 St., Escanaba, 2 story, brick, steel school addn. **$275,000.** CD 10/30.

Minn., Hector—SCHOOL—Bd. Educ., L. Rick, clk., voted $930,000 bonds, 2 story, part bsmnt., 60x192 ft. high school; 2 story, 60x140 ft. grade school wing; 2 story, 64x116 ft. gymnasium addn.; 1 story, 64x90 ft. shop area. H. H. Swanson, 500 Sexton Bldg., Minneapolis, archt. CD 11/17.

N. Y., Schenectady—SCHOOL—City, City Hall, plans by Perkins & Will, 309 W. Jackson St., Chicago 6, Ill., school. **$500,000.** CD 6/19.

O., Cleveland—DORMITORY—John Carroll University, N. Park Blvd., plans by Small, Smith & Reeb, 1010 Euclid Ave., 3 story, bsmnt., steel, masonry-concrete dormitory. **$500,000.** John Paul Jones, 1740 E. 12 St., consult. engr.

▲ **Tex., Edna**—HOUSING—Edna Housing Auth., A. O. Williams, chn., Edna, 175 housing units. **$1,325,000.** CD 12/4.

▲ **Tex., San Angelo**—SCHOOLS—San Angelo Independent School Dist., San Angelo, voted bonds school, $350,000; Senior High School, $450,000; gymnasium-stadium, $400,000; elementary school, $300,000. CD 11/29.

▲ **Tex., Snyder**—SCHOOLS, etc.—Snyder Independent School Dist., Snyder, bond election December 9, 1 and 2 story, brick, stone, hollow tile high school; concrete beam and footings fdn., $1,650,000; 18-room masonry elementary school and cafeteria, in East Snyder, $750,000; 18-room and cafeteria, masonry elementary school, Southwest Snyder, $750,000; gymnasium, field house, $350,000. CD 2/13.

† **Tex., Texarkana**—ORDNANCE PLANT—Fourth Army Headquarters, Fort Sam Houston, alterations, reconditioning, renovating, remodeling Ordnance Plant. **$500,000.**

Tex., Texarkana — SCHOOLS — Texarkana Independent School Dist., Texarkana, voted bonds, Junior-High School, $300,000; Negro Elementary, Jones Negro Elementary and elementary school for Whites addns., $300,000. CD 11/20.

Utah, Ogden—SCHOOL—Bd. Educ., c/o Dr. T. O. Smith, 2351 Grant Ave., plans by Lawrence D. Olpin, Kiesel Bldg., rein.-con., steel Senior High School. **$900,000.** CD 4/8/46.

B. C., Esquimalt—NAVY BARRACK—Dominion Government, Hunter Bldg., Ottawa, Ont., plans by Birley, Wade & Stockdill, 1020 Government St., Victoria, several stories, rein.-con. E-shaped navy barrack. Approx. $750,000.

Ont., Toronto—MEDICAL RESEARCH—University of Toronto, Dr. S. Smith, pres., Simcoe Hall, Queens Park, plans by Mathers & Haldenby, 15 St. Mary St., Charles H. Best Institute, new medical research bldg. adjoining Banting Institute, $700,000. CD 1/20/47.

Ont., Toronto—SCHOOL OF NURSING—University of Toronto, Dr. S. E. Smith, pres., Simcoe Hall, Queen's Park, Toronto, plans by Allward & Gouinlock, 57 Bloor St. W., school of nursing. **$600,000.** CD 1/20/47.

Que., Chateauguay Bassin—SCHOOL—School Comm., A. D. Boudrias, secy., plans by R. Dumais, 3995 Sherbrooke St. E., Montreal, 2 story, bsmnt., 55x135 ft., rein.-con., brick, block Central School. Approx. $650,000.

▲ **Que., Montreal**—SCHOOLS—Catholic School Comm., 117 Ste. Catherine St. E., school for Parish of Ste. Madeleine-Sophie, $400,000; school for Parish of Jesus-Ouvrier, $400,000; school, Henri Julien Ave. for Parish of St. Thomas Apostle, $480,000; school for Parish of Ste. Catherine, $350,000; school for Parish of St. Matthew, $310,000; plans by E. A. Doucet, 2245 W. Sherbrooke St., school, Christophe Columb St., for Parish of Ste. Emelie, $350,000.

Que., Val d 'Or—SCHOOL—Roman Catholic School Comm., J. A. Saucy, secy., plans by J. C. Fortin, P. O. Box 2089, Val d' Or, high school. Approx. $650,000.

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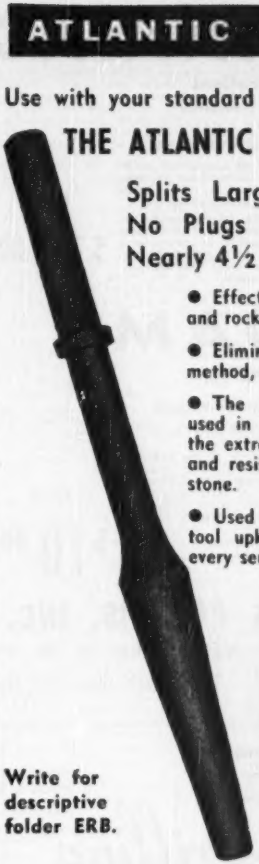

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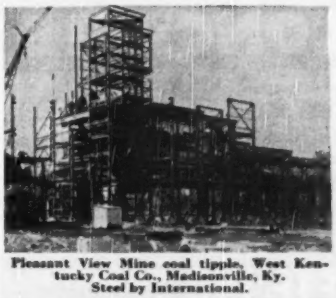

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COMMERCIAL BUILDINGS

Ala., Huntsville—HOUSING—Dpt. Army, South Atlantic Div., P.O. Box 1899, 536 Old Post Office Bldg., Atlanta, Ga., construct, manage, finance, 120 units housing at Redstone Arsenal. CD 5/27/49.

Ala., Selma—HOUSING—Dpt. Air Force, Dist. Eng., Mobile, Zone 7, construct, manage and finance 225 housing units, Craig Air Force Base.

Calif., Barstow—HOUSING—115th Naval Dist., P. Wks. Office, 1220 Pacific Hy., San Diego, construct, manage, finance 337 housing units at Marine Corps Supply Depot, S. H. Woodruff Assoc., 500 W. 7 St., Los Angeles, archts. and engrs. CD 3/13.

Calif., Inyokern—HOUSING—Eleventh Naval Dist., P. Wks. Office, 1220 Pacific Hy., San Diego, construct, manage and finance 497 housing units, Naval Ordnance Test C. & R. S. H. Woodruff, Assoc., 520 W. 7 St., Los Angeles, archts. and engrs. CD 3/2.

Calif., Lathrop—HOUSING—Dpt. Army, South Pacific Div., Oakland Army Base, Oakland, Zone 14, construct, manage and finance 96 housing units, Sharpe General Depot.

▲ **Calif., Middletown**—VILLAGE FOR BOYS—Amaranth Foundation of California, c/o Leonard Mosias, 255 California St., San Francisco, Village for Boys, near here. $1,000,000.

▲ **Calif., Montery Park**—DWELLINGS—Grandview Building Co., 470 S. Beverly Dr., Beverly Hills, plans by Allen G. Siple, 9507 Santa Monica Blvd., Beverly Hills, 187 frame, stucco dwellings in Tract 16513, $1,555,000.

Calif., Riverside—HOUSING—Dpt. Air Force, c/o Dist. Eng., 751 S. Figueroa St., Los Angeles, construct, manage and finance 644 housing units, March Air Force Base.

Calif., Torrance—DWELLINGS—ElCamino Homes, 331½ S. Robertson Blvd., Beverly Hills, plans by Hugh Gibbs, 441 E. 1 St., Long Beach, 65 frame, stucco dwellings, 166 St. and Crenshaw Blvd. $500,000.

Conn., New London—HOUSING—Dpt. Navy, 3rd Naval Dist., 90 Church St., New York, 7, N. Y., construct, manage and finance 450 housing units at Naval Submarine Base. Kelley & Gruzen, 80 Fifth Ave., New York, N. Y., archts.-engrs.

▲ **Conn., West Hartford**—STORE—Lord & Taylor, 5 Ave., New York N. Y., store with parking area. Bishops Corners, Albany Ave. and N. Main St. $1,000,000.

▲ **Ill., Chicago**—HOSPITAL, etc.—Presbyterian Hospital, 1753 Congress St., Zone 8, plans by Burnham & Hammond, 53 W. Jackson St., Zone 4, 8 story hospital addn. in West Side Medical Center, $3,000,000.

Ill., Glenview—HOUSING—Dpt. Navy, 9th Naval Dist., Great Lakes, construct, manage and finance 264 housing units at Naval Air Station. Pace Assoc., 513 W. Jackson Blvd., Chicago, archts.-engrs. CD 3/1.

▲ **Ill., Rockford**—MEDICAL CENTER—Rockford Memorial Hospital, 105 Douglas St., plans by Hubbard & Hyland, 303 N. Main St., and Perkins & Wills, 309 W. Jackson St., Chicago, medical center, $3,000,000.

Ind., Crane—HOUSING—Dpt. Navy, 9th Naval Dist., Great Lakes, construct, manage and finance 200 housing units at Great Lakes Naval Ordnance Depot. Allen & Kelley, G. Eng. Bldg., Indianapolis, archts.-engrs.

▲ **Md., Baltimore**—DWELLINGS—Eastern Bldg. Co., Court Square Bldg., Zone 2, plans by Kenneth C. Miller, 2203 N. Charles St., two hundred and seventy 2 story, 14x30x28 ft., brick dwellings, 6800 and 6900 blocks E. Pratt, Bank, Conley, Gough and Langdon Sts. $1,100,000.

▲ **Md., Baltimore**—RESIDENCES—Property Sales Co., 900 Court Square Bldg., Zone 2, two hundred and ninety-one 2 story, 16x32x28 ft., brick, concrete residences, Hillendale Rd., Loch Raven Heights, $2,000,000.

Mass., Boston—HOUSING—Dpt. Navy, 1st Naval Dist., Headquarters 495 Summer St., construct, manage and finance 127 housing units in North Boston. Glaser & Gray, 105 Newberry St., archts.-engrs.

Mass., Cambridge—STUDENTS ACTIVITY CENTER—Harvard University, 16 N. Harvard St., plans by Perry, Shaw, Hepburn, Kehoe & Dean, 31 St. James Ave., Boston, brick, steel, concrete students activity center, Kresege Hall; brick, steel concrete Aldrich Hall.

Mass., South Boston—HOUSING—Dpt. Navy, 1st Naval Dist., Headquarters, 495 Summer St., Boston, construct, manage and finance 302 housing units. I. Richmond & C. Goldbert, 16 Arlington St., Boston, archts.-engrs. CD 9/6.

N. M., Las Cruces—HOUSING—Dpt. Army, Southwestern Div., 1114 Commerce St., Dallas 2, Tex., construct, manage, finance 235 housing units, White Sands Proving Grounds.

▲ **N. Y., Flushing**—APARTMENTS—Charles Operating Corp., c/o Kavy & Kavavitt, archts., 44 Court St., Brooklyn, Zone 2, 9 story garden apartments, Franklin and Blossom Aves., west of Main St. $1,320,600.

N. Y., Newburgh—HOUSING—Dpt. Air Force, Dist. Engr., 80 Lafayette St., New York, Zone 13, construct, manage, finance 284 housing units, Stewart Air Force Base.

▲ **N. C., Winston-Salem**—HOSPITAL—Baptist Hospital, S. Hawthorne Rd., 8 story, brick, concrete, limestone hospital wing addn. $1,000,000. Schmidt, Garden & Erickson, 104 S. Michigan St., Chicago 3, Ill., archts. CD 11/25/46.

Ore., Tongue Point—HOUSING—Dpt. Navy, 13th Naval Dist., Naval Receiving Office, Seattle, Wash., 50 hous-

ing units, Naval Station. Don Byers, Builders Exchange Bldg., Portland, engr. and archt.

Pa., Whitehall (Pittsburgh)—CONVENT, etc.—Sisters of St. Francis of the Providence of God, Brentwood, plans by Bro. Cajetan B. J. Bauman, 44 Whitehall St., New York, N. Y., 4 story brick, steel convent and chapel. $500,000.

▲ **Pa., Willow Grove**—HOUSING—Pub. Wks. Office, 4th Naval Dist., Phila. Naval Base, Phila., construct, manage, finance 124 housing units, Naval Air Station. $1,116,000. W. R. Morton Keast, Commonwealth Bldg., Phila., engr. and archt. CD 9/1.

R. I., Davisville—HOUSING—Dpt. Navy, 1st Naval Dist., Navy Dpt., 495 Summer St., Boston, 10, Mass. construct, manage, finance 522 housing units, Quonset Point Naval Air Station. Charles A. Maguire, Turks Head Bldg., Providence, engr. and archt.

S. C., Shaw Air Force Base—HOUSING—Dpt. Air Force, S. Atlantic Div., Old Post Office Bldg., Atlanta, Ga., construct, manage, finance 500 housing units.

Tex., Dallas—HOUSING—Dpt. Navy, 8th Naval Dist., 600 South St., New Orleans, La., construct, manage and finance 129 units housing at Navy Air Station. Wyatt C. Hedrick, 904 Fort Worth Ave., engr. and archt.

▲ **Tex., Dallas**—DWELLINGS—W. R. Hawn & Jack Neece, 10418 Garland Rd., 70 frame dwellings, concrete slab fdn. in an area off Buckner Blvd., $560,000; 90 addnl. frame dwellings, concrete slab fdn., in an area of Pleasant Grove. $720,000.

▲ **Tex., Dallas**—DWELLINGS—Vernon S. Smith, 2153 Fort Worth Ave., 150 dwellings. $1,200,000.

▲ **Tex., Fort Worth**—HOUSING—Dpt. Air Force, The Pentagon, Wash. 25, D. C., construct, manage, finance, 480 housing units at Carswell Air Force Base. $4,320,000.

▲ **Tex., Houston**—HOTEL—Ruben & Leo Brand, 2804 Southmore St., 200-room masonry hotel, 8 acres on Main St. near Old Spanish Trail intersections. $1,000,000.

▲ **Tex., Lake Jackson**—DWELLINGS—Brazosport Building Co., Freeport, 144 frame dwelling and duplex units concrete slab fdns., in area "G", $950,400.

▲ **Tex., Lubbock**—HOUSING—Dpt. Air Force, The Pentagon, Wash. 25, D. C., construct, manage, finance 418 housing units at Reese Air Force Base. $3,762,000.

▲ **Tex., San Angelo**—HOUSING—Dpt. Air Force, The Pentagon, Wash. 25, D. C., construct, manage, finance 400 housing units at Goodfellow Air Force Base. $3,600,000.

▲ **Tex., San Antonio**—HOUSING—Dpt. Air Force, The Pentagon, Wash. 25, D. C., construct, manage, finance, 600 housing units, at Lackland Air Force Base near here $5,400,000.

Tex., San Antonio—STORES—Handy-Andy Community Stores, Inc., 801 N. Cherry St., plans by Shoop & Roberts, 122 W. Olmos St., 30,000 sq. ft. concrete frame, brick, hollow tile stores, concrete beam and pier fdn. $300,000.

▲ **Tex., Sherman**—HOUSING—Dpt. Air Force, The Pentagon, Wash. 25, D. C., construct, manage, finance, approx. 300 housing units at Perrin Air Force Base. $2,700,000.

Tex., Texarkana—HOUSING—Dpt. Army, Southwestern Div., 1114 Commerce St., Dallas, Zone 2, construct, manage, finance 55 housing units, at Red River Arsenal.

▲ **Tex., Wichita Falls**—HOUSING—Dpt. Air Force, The Pentagon, Wash. 25, D. C., construct, manage, finance, 612 housing units at Shepherd Air Force Base. $5,508,000.

Utah, Tooele—HOUSING—Dpt. Army, Dist. Eng., Wright Bldg., Sacramento, Calif., construct, manage, finance, 150 housing units, Deseret Chemical Depot.

Utah, Tooele—HOUSING—Dpt. Army, Dist. Eng., Wright Bldg., Sacramento, Calif., construct, manage, finance, 200 housing units, Dugway Proving Ground.

Va., Portsmouth—HOUSING—Dpt. Navy, 5th Naval Dist., Naval Base, Norfolk, construct, manage, finance 159 housing units at Naval Shipyard. E. Tucker Carlton, 1009 E. Main St., Richmond, engr. and archt.

Va., Richmond—HOUSING—Dpt. Army, Div. Eng. North Atlantic Div., 80 Lafayette St., New York 13, N. Y., construct, manage, finance, 16 housing units, Quartermaster Depot.

Wash., Seattle—Y.W.C.A. BLDG.—Y.W.C.A., 5 and Spring Sts., Zone 1, Y.M.C.A. bldg. alterations, $800,000.

Puerto Rico, Ramey Air Force Base—HOUSING—Dpt. Air Force, Div. Eng., Old Post Office Bldg., Atlanta, Ga., construct, manage, finance, 575 housing units.

INDUSTRIAL BUILDINGS

Ala., Birmingham—WAREHOUSE, etc.—Dairy Products Co., 1622 2 Ave. S., plans by Southern Designers, 14226 First Ave. N., warehouse and office, $150,000.

Ill., Chicago—PLANT—Stepan Chemical Co., 1957 W. Lawrence St., Zone 25, chemical plant, S. Kedzie Ave. and Belt Ry. Co. tracks. $200,000.

Ill., Franklin Park—FACTORY—Powdered Metal Products Co., of America, 9235 W. Belmont St., factory expansion. $100,000.

Ind., Indianapolis—FREIGHT TERMINAL, etc.—Federal Express Inc., 577 W. Ray St., freight terminal and office, 1750 E. 30 St. $350,000.

Mass., Worcester—WAREHOUSE, etc.—H. E. Shaw Co., 81 Mechanic St., plans by L. W. Briggs Co., 90 Park Ave., warehouse and showroom, Belmont St. and Lake Ave. $750,000.

▲ **Minn., Babbitt**—PLANT—Reserve Mining Co., c/o Republic Steel Corp., Republic Bldg., Cleveland, O. and Armco Steel Co., 1939 Armco Ave., Middleton, O., taconite pellet pilot plant, opening mine and constructing town, $7,500,000; taconite pellet plant, 47 mi. railroad, loading facilities dock and harbor, Beaver Bay on Lake Superior, $60,000,000.

Neb., Auburn—FACTORY—Auburn Machine Wks., Auburn, plans by N. S. Wallace, Omaha Natl. Bank Bldg., Omaha, factory. $150,000.

N. D., Crosby—PLANT—Sodium Corp. of America, 8124 S. Hoyne St., Chicago, Ill., dehydration plant, near here. $350,000.

Pa., Butler—PLANT—Air Reduction Sales Co., 60 E. 42 St., New York, N. Y., 1 story, 75x380 ft. brick, steel mfg. plant, oxygen and gases. Approx. $500,000.

▲ **Pa., Harrisburg**—PLANT—Patriot News Co., Edwin F. Russell, publisher, 11 N. 2 St., newspaper plant, incl. all departments and offices, Market St. near Ninth St. $2,500,000.

▲ **Tenn., Chattanooga**—PLANT—Tennessee Products & Chemical Corp., American Natl. Bank Bldg., Nashville, chlorine plant. $3,500,000.

Tenn., Waverly—MILL—Waverly Milling Co., Waverly, rebuild mill. $100,000.

Tex., El Paso—STORAGE—Mountain States Telephone & Telegraph Co., 510 Texas St., plans by R. C. Bryant, Box 960, Denver, Colo., telephone and telegraph equip. and storage. $200,000.

▲ **Tex., Fort Point**—PLANT—Aluminum Co. of America, Fort Point, via Port Lavaca, aluminum producing plant expansion, "Pot Line" unit. $7,000,000.

Tex., Houston—PLANT—Arrow Mills, Inc., Becker Ave., grain plant expansion. $150,000. Finis E. Cowan, c/o owner, engr.

Tex., Houston—GARAGE—Transcontinental Gas Pipe Line Corp., Oil & Gas Bldg., doubling garage, Rosalie and Milam Sts. $250,000.

Tex., San Antonio—PARKING GARAGE—Travis-Soledad Co., c/o A. E. Robertson 1619 N. Pine St., plans by Atlee B. & Robert M. Ayres, Transit Tower, Unit 1, downtown parking garage, W. Travis St. between Soledad St. and River. $300,000. CD 11/27.

Wis., Wisconsin Rapids—FACTORY—Wisconsin Consolidated Water Power & Paper Co., Wisconsin Rapids, 1 story, bsmnt., 68x131 ft., steel brick factory addn.

▲ **B. C., Vancouver**—BREWERY PLANT, etc.—Sicks' Capilano Brewery Ltd., 1445 Powell St., 1 story rein.-con., brewery plant and offices, center portion extending 138 ft. will be 5 story. $1,000,000. Don McRoberts, 1445 Powell St., engr. CD 8/8.

▲ **Newfoundland, Humbermouth**—MILL—Syndicate, c/o Dr. A. A. Valdmanis, St. John's, gypsum mill. $2,000,000.

▲ **Newfoundland, Lake Melville**—MILL—Syndicate, c/o Hon. J. R. Smallwood, St. John's, paper mill. $3,000,000.

Ont., Toronto—FACTORY—Smith Mfg. Co. Ltd., 207 Front St. E, 100,000 sq. ft. factory, Wilson Ave., near new Toronto-Barrie Hy. Approx. $500,000. Giffels & Vallet of Canada Ltd., Canada Trust Bldg., Windsor, engr. CD 6/2.

▲ **Ont., Woodstock**—PLANT—Standard Tube Co. Ltd., Drew St., Toronto, plant expansion. $3,000,000.

UNCLASSIFIED

Mo., Pagedale (St. Louis 14, P. O.)—DRIVE-IN THEATER—Kilgore Amusement Co., William Kilgore, pres., 9106 Shelley Ave., Overland, St. Louis, Zone 14, plans by W. H. Mills & Son, 8032 Forsyth St., Clayton, St. Louis, Zone 24, 700-car drive-in motion picture theater, on 11½ acre tract west side Kingsland Ave. south of St. Charles Rock Rd. (Easton Ave.). $150,000.

Nebraska—RURAL DISTRIBUTION LINES—Consumers Public Power Dist., Columbus, 81 mi. rural distr. lines, Cedar, Dixon and Dakota Counties. $250,000.

▲ **Neb., Omaha**—PARKS—City, City Hall, 18 and Farnam Sts., defeated $1,000,000 bonds, park facilities. E. W. Woodbridge, city engr. CD 9/25.

N. C., Raleigh—RECREATIONAL FACILITIES—City, bond election Jan. 27, recreational facilities. $250,000.

Oklahoma—TRANSMISSION LINE—Grand River Dam Auth., Vinita, 69,000 volt transmission line from Camp Gruber to Sallisaw, Sequoyah Co. $175,000. W. R. Holway, 302 E. 18 St., Tulsa, consult. engr.

South Dakota—RURAL DISTRIBUTION LINES—Sioux Valley Empire Electric Assn., Colman, rural distr. lines, Moody Co. $700,000. $578,000 REA allot Robert F. Risch, c/o owner, engr. Buell & Winter, 508 Insurance Exchange Bldg., Sioux City, Ia., consult. engrs. CD 6/29.

† **Utah, Tooele**—SWIMMING POOL—U. S. Eng., Presidio, San Francisco, Calif., swimming pool at Deseret Chemical Depot. $130,000.

▲ **Ontario**—PIPE LINE—Imperial Oil Ltd., Sarnia, 190 mi. pipe line Sarnia to London on to Hamilton and Toronto.

▲ **Quebec**—RAILWAY—Canadian National Rys., B. Wheelwright, ch. engr., 360 McGill St., Montreal, further 165 mi. railway from Beattyville to Bachelor Lake in Northern Quebec towards Lake St. John. Approx. $14,000,000.

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CONSTRUCTION REPORTS-Second Section

WATER SUPPLY

CONTRACTS AWARDED

▲ **N. D., Minot**—City, water treatment plant, to Blue Contg. Co., Velva, $1,189,500. Bids 11/15. CD 11/22, under LB.

SEWERS, WASTE DISPOSAL

BIDS ASKED

Calif., Los Angeles—B.A. 1/2—Bd. Supervs. Los Angeles Co., 501 Hall of Records, 2.14 mi. sanitary sewers in Meeker Ave., El Monte, $63,650; 6.17 mi. sanitary sewers in Woodbury Rd., Altadena, C.I. 1270, $204,450; 5.55 mi. sanitary sewers in Sinaloa Ave., Altadena, C.I. 1280, $151,350. C. E. Arnold, co. engr. CD 3/3.

Ore., Portland—B.A. 1/4—City, City Hall, construct Alder Street Sewage pump Station; construct Water Street Sewage Pump Station. Plans deposit $25 each. L. G. Apperson, city engr. CD 7/20/45.

LOW BIDDERS

▲ **Ill., Chicago**—Sanitary Dist. of Chicago, 910 S. Michigan Ave., Zone 5, Racine Ave., Dec. 7, Pumping Station addn., from Fitz Simons & Connell Dredge & Dock Co., 10 S. LaSalle St., Zone 3, $1,566,075. CD 11/29.

BRIDGES

BIDS ASKED

STATE HIGHWAY LETTINGS
January 10
Louisiana

New Jersey—B.A. 12/28—New Jersey Turnpike Auth., 65 Prospect St., Trenton,

Hudson Co.—Contract 52, concrete deck for Hackensack River Bridge. Plans deposit $5. Howard, Needles, Tammen & Bergendoff, 55 Liberty St., New York, N. Y., engrs. CD 7/13/49, under Streets and Roads.

N. Y., New York—B.A. 1/3—Dpt. P. Wks., Municipal Bldg., Zone 7, reconstruct Manhattan and Bronx approaches of Willis Avenue Bridge over Harlem River, Bronx and Manhattan Boros. Plans deposit $30. CD 8/20/45.

N. Y., New York—B.A. 1/17—Dpt. P. Wks., Municipal Bldg., Zone 7, Contr. 3, Unionport Bridge substructures and superstructures, north unit. Plans deposit $25. CD 1/15/44.

† **Wyoming and South Dakota**—B.A. 1/2—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Moorcroft, Wyo., structural steel, incl. stringers, diaphragms, bearings, expansion joint, railing and field rivets for the highway bridge at Station 831 plus 60 relocation of State Hy. U. S. 14, Keyhole Unit, Cheyenne Div., Missouri River Basin Proj., Spec. DS-3260. L. N. McClellan, ch. engr. CD 12/14/49.

LOW BIDDERS

▲ **Texas**—State Hy. Comn., Austin, Dec. 12, superstructures for Neches River Bridge, Hy. U. S. 90, FI 328 (4), Orange Co., and rein.-con. Arroya Colorado Bridge, Cameron Co., from Texas Constr. Co., P.O. Box 1364, Dallas, $2,087,989, est. $1,125,000 and $518,329, est. $345,000 respectively; grade separation on Hy. U.S. 75, F.I. 466 (18), Galveston Co., from Austin Road Co., P.O. Box 1590, Dallas, $316,007, est. $190,000. CD 11/24 and 11/28.

CONTRACTS AWARDED

▲ **New York**—Bureau Contracts & Accounts, Albany, substructure for high level, Fuhrmann Blvd. bridge, Erie Co., to Bates & Rogers Constr. Corp., 600 W. Jackson St., Chicago, Ill., $1,397,433. Bids 11/1. CD 11/3, under LB.

STREETS AND ROADS

BIDS ASKED

STATE HIGHWAY LETTINGS

December 28	Ontario
Louisiana	January 4
Pennsylvania	California
January 3	January 10
California	Louisiana

N. Y., New York—B.A. 12/27—President Manhattan Boro, Municipal Bldg., improv. 42 St., 1st to 2nd Aves. and Tudor City Pl., E. 41 to E. 43 Sts., vicinity of United Nations site, grading, curbing, paving, incl. bridge across E. 42 St. at Tudor City Pl., retaining walls, pedestrian stairways, ramps, demolition of bldgs., lighting, etc. Plans deposit $50. Extended date. CD 11/28.

Tex., Lubbock—B.A. 12/28—City, caliche base and asph. topping for streets, 54,000 lin. ft. concrete curbs and gutters, street grading, drainage. $265,000. Plans deposit $25. G. K. Harris, city engr. CD 9/7.

Mo., Kansas City—B.A. 1/16—City, Dpt. P. Wks., City Hall, Zone 6, Southwest Trafficway from 38 and Summit Sts., connection with Madison and Belleview Aves. at 43 St. John E. Maring, city engr. CD 11/10/47.

LOW BIDDERS

▲ **New York**—Bertram D. Tallamy, supt. New York tate P. Wks., Albany, Dec. 13, construct 5.06 mi. New York State Thruway and 3.24 mi. access roads, extending northwesterly from point on Route 9W approx. ½ mi. north of Normans Kill Creek to Route 20 approx. 500 ft. west of School House Rd., etc., Albany Co., from Collins Bros., 12 Talimadge Pl., Mechanicville, $1,661,945, est. $1,965,000*** 20 ft. bit. grav. pavement 1.63 mi. Phoenicia-Stony Clove Hy. (Route 214) from connection with recently completed pavement north of Stony Clove to Katterskill Junction just south of Route 23 A, incl. 2 small bridges, etc., Greene Co., and construct 24 to 36 ft. b. conc. on 1.76 mi. of Route 199 extending easterly from its intersection with Route 9G, east of Barrytown, to its intersection with Route 9 in village of Red Hook, etc., Dutchess Co., from John Arborio, Inc., W. Cedar St., Poughkeepsie, $203,243, est. $214,000 and $287,499, est. $340,000 respectively***construct 22 ft. b. conc. pavement on 10 mi. town road connecting with the 16-ft. paved town road in village of Hinckley, Oneida Co., extending northeasterly along north side of Hinckley Reservoir to connection with Route 8 west of Wilmurt, Herkimer and Oneida Counties, from Arute Bros., Inc., 560 S. Main St., New Britan, Conn., $824,250, est. $1,003,000***24 ft. b. conc. pavement 4.82 mi. Lake Ontario State Parkway, previously graded, extending easterly from Yanty Creek in Hamlin Beach State Park to Walker Lake Ontario R. (Route 260), incl. 16 ft. b. conc. pavement 3.49 mi. service roads, etc., Monroe Co., from Bero Eng. & Constr. Corp., McKinley Bldg., Buffalo, $961,070, est. $1,222,000***received no bids Dec. 13, chain link fence constr. 4.59 mi. Southern State Parkway extending easterly from Foster's Meadow Rd. just east of the Cross Island Parkway to Eagle Ave. at Hempstead Lake State Park and 4.12 mi. of Northern State Parkway extending easterly from point about 1½ mi. east of Route 107 just east of Long Island R.R. (Port Jefferson Branch) to Round Swamp Rd. approx. 1½ mi. west of Route 110, etc., Suffolk and Nassau Counties, est. $81,000. CD 11/30 and 11/17.

EARTHWORK, WATERWAYS

BIDS ASKED

† **Illinois**—B.A. About 12/26—U. S. Eng., 834 U. S. Court House & Custom House, 1114 Market St., St. Louis, Mo., crushed stone or gravel road surfacing 5.8 mi. levees Project Item I-E Grand Tower Drainage and Levee Dist., Jackson Co., adjacent to Grand Tower, Inv. No. CIVENG-23-065-51-36. CD 4/27/44.

† **Florida**—B.A. About 12/27—U.S. Eng., P. O. Box 4970, Jacksonville, 21.7 mi. main levee and canal in Palm Beach Co., east of Lake Okeechobee between the north end of portion (now under constr.) and Lake Okeechobee, 2.04 mi. tie-back levee running north from main levee at point about 2 mi. east of Lake Okeechobee, 16 steel sheet piling spillways, 1 three-gated rein.-con. spillway, pump station with pumps, 3 timber bridges, culvert with concrete headwalls, Canal and Levee L-8, Central and Southern Florida Flood Control Proj. Inv. No. CIVENG -08-123-51-22. CD 6/9/44.

† **Louisiana**—B.A. 12/27—U. S. Eng., foot of Prytania St., New Orleans, Zone 9, Intracoastal Waterway, Vermilion Lock, 2,250 lin. ft. guide walls and fender repairs, CIVENG 16-047-51-99.

† **North Dakota**—B.A. 12/28—U. S. Eng., 1217 U. S. Post Office & Custom House, St. Paul 1, Minn., channel snagging, Stage 2, Shevenne River, in eastern part Cass Co., Serial No. CIVENG 21-018-51-28. CD 12/5.

† **Washington**—B.A. 12/28—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. shipping point or f.o.b. cars Odair, misc. structural steel and aluminum for Grand Coulee Dam, Columbia Basin Proj., Spec. DS-3258. L. N. McClellan, ch. engr.

† **Wyoming**—B.A. 12/28—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars Emery bulkhead, bulkhead gate lifting beam bulkhead frames, guide angles, latches, bulkhead gate frame Boysen Power Plant, Boysen Div., Boysen Unit, Missouri River Basin Proj., Spec. DS-3255. L. N. McClellan, ch. engr. CD 6/1/44.

† **Louisiana**—B.A. 12/29—U. S. Eng., foot of Prytania St., New Orleans, Zone 9, clearing, snagging Wallace Bayou from its mouth in Bayou Pierre to point 1,000 ft. downstream from Wallace Lake Dam, approx. 3.2 mi., CIVENG 16-047-51-103.

† **Montana**—B.A. 1/2—Bureau Reclamation, Bldg. 1 A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Coraon fabricated structural steel, field assembly bolts and rivets for take-off structure for Hungry Horse Power Plant, Hungry Horse Proj., Spec. DS 3250. L. N. McClellan, ch. engr.

AIRPORTS

BIDS ASKED

Minn., Minneapolis—SHOP—B.A. About 1/1—Mid-Continent Airlines, Inc., Wold-Chamberlain Field, shop bldg. at air field, $225,000. Larson & McLaren, 1901 Foshay Tower, archts. CD 10/13.

LOW BIDDERS

▲† **Calif., Moffett Field**—WIND TUNNEL—National Advisory Committee for Aeronautics, Ames Aeronautical Laboratory, Moffett Field, Dec. 6, elec-drive system of 8 ft. supersonic wind tunnel, Spec. A-4602, Reg. A-4602, from General Electric Co., 235 Montgomery St., San Francisco, $5,040,402.

PUBLIC BUILDINGS

BIDS ASKED

▲ **Conn., Waterbury**—SCHOOL—B.A. about 12/25—State, State Capitol, Hartford, 1 and 2 story, brick, concrete trade school, Watertown Ave. $1,000,000. Paul Bemis, 36 Pearl St., engr. Carl Malmfeldt & Assoc., 36 Pearl St., Hartford, archts. CD 8/9.

Mich., Big Rapids—SCHOOL—B.A. 12/27—State, A. N. Langius, dir. State Bldg. Dpt., State Office, Lansing, brick, steel school, Ferris Institute, $900,000. Roger Allen & Assoc., 1126 Grand Rapids National Bank, Grand Rapids, archts. CD 8/14.

Mass., Watertown—HOUSING—B.A. 12/28—Town of Watertown Veteran's Housing Auth., 3 story, brick 60 unit veterans housing, Proj. 200-2, Melendy Ave. and Quimby St. $750,000. Plans deposit $50. Edward Sears Read & Assoc., 177 State St., Boston, archts. CD 4/4.

Fla., Vero Beach—HOSPITAL—B.A. About 12/29—Indian River Memorial Hospital Assn., Court House, hospital, $600,000. Reynolds, Smith & Hills, 227 Park St., Jacksonville, archts. CD 7/24.

Fla., Hollywood—GARAGE—B.A. 1/2—City, Hollywood, 260x260 ft. garage for vehicle storage and repairing.

LOW BIDDERS

Conn., New Britain—HALL—State, R. S. Thatcher, comptroller, State Capitol Bldg., Hartford, Nov. 27, B.A.-4-64, constr. Henry Barnard Hall, arts and science bldg., Teachers College, from The Edward Pactor Co., 462 Silas Deane Hy., Wethersfield Base Bid $824,713, Plus Alt. 1, $17,500; Alt. 2, $132,712; Alt. 3, $304,712. CD 11/9.

▲ **Conn., West Hartford**—SCHOOL—Town, Bd. Educ., Memorial Rd., Nov. 28, Louise Duffy School, Westminster Rd. and Spring Lane, from Wadham & Williams Co., 15 Lewis St., Hartford, $1,512,250.

▲ **Ga., Americus**—HOUSING—Americus Housing Auth., Americus, housing, from E. A. Scott & Son, Americus, $1,128,971. CD 11/29.

Mich., Flint—SCHOOL—City, Bd. Educ., J. A. Anderson, secy., Nov. 21, 2 story, bsmnt., brick, steel, concrete Ernest W. Potter School, from Spence Bros., 417 McCoskry St., $975,000. CD 11/6.

▲ **Minn., Richfield**—SCHOOL—Bd. Educ., H. E. Rumpel, supt., rejected bids Nov. 9, high school, 72 St. and Harriet Ave., L. B. $1,521,000. Will re-advertise. CD 11/22, under L.B.

▲ **N. J., Phillipsburg**—HOUSING—Phillipsburg Housing Auth., Municipal Bldg., 150-unit low rent housing in Roseberry St., from John A. Johnson & Sons, 313 41 St., Brooklyn, N. Y., $1,093,000. Bids 12/7, awarded 12/9. CD 11/13.

▲ **N. Y., Woodside**—SCHOOL—Supt. School Buildings, Design & Constr., 49 Flatbush Ave. exten., Brooklyn, Zone 1, Dec. 5, general contract, P. S. 11, Skillman Ave. from 56 to 54 Sts., from Colmar Constr. Co., 364 Gold St., Brooklyn, Zone 1, $1,254,364. (Correction—status). CD 12/7, under CA.

▲ **N. C., Charlotte**—HOUSING—Charlotte Housing Auth., 831 Seigle Ave., Dec. 6, 400 dwelling units, from Southeastern Constr. Co., 301 W. 2 St., $3,305,000. CD 11/9.

▲ **N. C., Kinston**—HOUSING—Kinston Housing Auth., Kinston, housing units, from Rogers Constr. Co., Smithfield, $1,235,000. CD 11/17.

▲ **Tenn., Clarksville**—HOUSING—Clarksville Housing Auth., Clarksville, housing, Tenn 10-1 and 10-2, from Clarke Constr. Co., Owensboro, Ky., $1,719,691. CD 11/21.

▲ **Tenn., Nashville**—OFFICE—State of Tennessee, Nashville, rejected bids Dec. 5, state office bldg., L. B. $7,576,000. CD 12/18, under LB.

Tex., Lubbock—SCHOOLS—Lubbock Independent School Dist., Lubbock, Nov. 29, elementary or grade school, 36 and Toledo Sts., and 106x333 ft. structural steel, brick F. E. Wheelock Grade or Elementary School, 42 St. and Elgin Ave., from Joe Telford, 120 Avenue F. $501,000. CD 11/20.

▲ **Wash., Seattle**—SCHOOL—School Dist. 1, 815 4 Ave. N., Dec. 7, general contract, 2 story, 78x134 ft., 133x 167 ft., 98x158 ft., 64x27-72 ft., 43x164 ft. and 73x77 ft., 74x283 ft., 92x162 ft., and 90x207 ft., rein.-con., structural steel bldgs., for David T. Denney Junior High School in southwest part of city, from Strand & Sons, 3939 University Way, Zone 5, $1,272,000. CD 11/9.

CONTRACTS AWARDED

Calif., Hawthorne—SCHOOL—Centinela Valley Union High School Dist., reinforced brick Hawthorne High School, to Milton Kaufman Constr. Corp., 2918 W. Compton Blvd., Los Angeles, $960,000. Bids 11/21, awarded 12/4. CD 11/29, under LB.

▲ **Calif., Sacramento**—PUBLIC WORKS—State Div. Architecture, P. Wks. Bldg., Sacramento, general contract 180,000 sq. ft. rein.-con., steel, public works bldg. annex, to Haas & Rothschild, 274 Brannan St., San Francisco, $1,508,250. CD 11/29, under LB.

Conn., Storrs—AGRICULTURAL INDUSTRIES—State, R. S. Thatcher, comptroller, State Capitol, Hartford, agricultural industries bldg., University of Connecticut, B/A-D-138, to Frederick Raff Co., 271 Sheldon St., Hartford, $587,450. Bids 10/3, awarded 11/20. CD 10/18, under LB.

Conn., Storrs—ANIMAL INDUSTRIES, etc.—State, R. S. Thatcher, comptroller, State Capitol, Hartford, animal industries and dairy, University of Connecticut, B/A-D-135, to Mondelci & Benvenuti, 16 Elm St., New London, $531,000 Bids 10/5, awarded 11/20. CD 10/20, under LB.

▲ **Fla., Tallahassee**—DORMITORIES—State Bd. Control, Tallahassee, general contract 11 story mens dormitory, Florida State University, to Beers Constr. Co., 70 Ellis St. N. E., Atlanta, Ga., $1,429,000, CD 10/27, under LB; general contract 8 story, 346 womens dormitory at Florida State University to J. A. Jones Constr. Co., 209 W. 4 St., Charlotte, N. C., $750,000, CD 10/25, under LB.

▲ **Ill., Chicago**—HOUSING—Chicago Housing Auth., 608 S. Dearborn St., Zone 6, one 14 story apartment, three 7 story admin. bldg., boiler house, 274 units, 26 and Calumet Sts., to Jacobson Bros. Co., 20 N. Wacker Dr. Zone 6, $2,322,000. Awarded 12/7. CD 12/5 under LB.

▲ **Ill., Chicago**—HOUSING—Chicago Housing Auth., 608 S. Dearborn St., Zone 5, two 7 story, 74 unit, 30x275 ft. apartments, 23 and Archer Sts., to S. N. Nielsen Co., 3059 Augusta Blvd., Zone 12, $1,520,000. Awarded 12/6. CD 11/30, under LB.

Mich., Plymouth—SCHOOL—City, Bd. Educ., brick, steel school addn., incl. gymnasium and auditorium, to Ward S. Ross, Plymouth, $665,000. Nathaniel O. Gould, Plymouth, archt. CD 10/5/49.

▲ **N. Y., Little Neck**—SCHOOL—Supt. School Buildings, Design & Constr., 49 Flatbush Ave. exten., Brooklyn, Zone 1, general contract P.S. 186 Little Neck Parkway and 72 Ave., Queens Boro, to Planet Constr. Corp., 11 W. 42 St., New York, Zone 18, $1,295,000. Bids 11/14. CD 11/17, under LB, New York.

▲ **N. C., Goldsboro**—HOUSING—Goldsboro Housing Auth., c/o contractor, housing, to T. A. Loving & Co., Bank of Wayne Bldg., $1,876,740. Bids 12/1. CD 12/7, under LB.

▲ **R. I., Providence**—LIBRARY—City, City Hall, Central Public Library addn., alterations, Washington, Empire and Fountain Sts., to E. Turgeon Constr. Co., Inc., 42 Weybossett St., $1,565,592. Awarded 12/7. CD 12/8, under LB.

▲ **Tenn., Clarksville**—HOUSING—Clarksville Housing Auth., Clarksville, two housing projects, to Clark Constr. Co., Owensboro, Ky., $1,719,691. CD 12/13, under LB.

▲ **Va., Norfolk**—HOUSING—Norfolk Housing Auth., c/o Alfred M. Lublin archt., 931 W. 21 St., housing units, Proj. VA 6-6, to John A. Johnson & Sons, Warehouse Rd., Oak Ridge, Tenn., $2,597,000. CD 11/13.

COMMERCIAL BUILDINGS

BIDS ASKED

Pa., Bethlehem—HEALTH and PHYSICAL EDUCATION—B.A. 12/28—Trautwein & Howard, archts., 1411 Walnut St., Phila., health and physical educ. bldg., for Moravian College and Theological Seminary, Bethlehem. Approx. $350,000. Gibson & Kline, 1411 Walnut St., Phila., engrs. CD 11/15.

▲ **Ky., Louisville**—DEPARTMENT STORE—B.A. 12/29—Henry A. Marks and Dolph Hartveld, Union Trust Bldg., Cincinnati, O., (selected list bidders), 3 story, bsmnt., department store, $2,500,000. Extended date. J. C. Penney Co., 330 W. 34 St., New York, N. Y., lessee. CD 12/4.

Ill., Aurora—HOTEL—Bids Asked—Leland Hotel Corp., 7 S. Island St., modification in hotel for new tenants. $300,000. Fox Valley Engineering Service, 17 Island St., archt.

LOW BIDDERS

Md., Baltimore—SCHOOL—St. Mary's R. C. Church, York Rd. and Markland Ave., 2 story school, 1½ story, bsmnt., convent, stone, concrete, steel, from Morrow Bros., Inc., 2315 N. Charles St., $710,000, Jas. R. Edmunds, Jr., 130 W. Hamilton St., archt. Van Rensselaer Saxe, 100 W. Monument St., struct. engr. Henry Adams, Inc., 2315 St. Paul St., mech, engr. CD 5/18.

▲ **Mo., St. Louis**—NURSING SCHOOL—DePaul Hospital, Sisters of Charity, Sister M. Andrea, pres., 2415 N. Kingshighway, Dec. 8, general contract 9 story, bsmnt., 42x238 ft. and 58x60 ft., T shaped, brick, rein.-con. nursing school, from Robert Paulus Constr. Co., 3441 Morganford Rd., Zone 16, $1,539,556. CD 11/27.

▲ **Pa., Phila.**—APARTMENT—Mr. & Mrs. Donald D. Dodge, 32 Summit St., apartment development, Mermaid Lane, etc. from Henry E. Baton, Inc., 1717 Sansom St., $3,000,000. Bids 10/12. Oscar G. Stonorov, Broad St. Station Bldg., archt. CD 10/11.

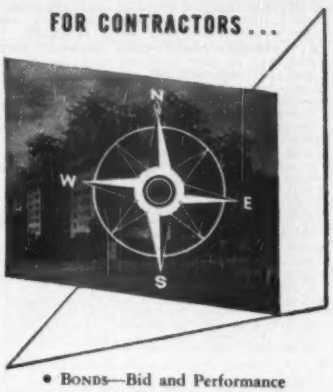
CONTRACTS AWARDED

Calif., Danville—RESIDENCES—Scherer & Hobart Co., c/o F. W. Anderson, 576 66 St., Oakland, 105 residences in Cameo Acres No. 3, Owner builds, $750,000.

PROMPT, NATION-WIDE

BONDING FACILITIES

FOR CONTRACTORS . . .



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Otis K. Olson Co., 823 Perdido St., New Orleans, La.
Philip D. Barnard, 2006 Addison, Houston 8, Tex.
Western Steel Prod. Co., 1755 W. 13th Ave., Denver 4, Colo.

Calif., Santa Monica—DWELLINGS—Moss Constr. Co., 14901 Magnolia Blvd., 60 frame, stucco dwellings, Saloma, Lemoni, Kester and Norwich Aves. Owner builds, $519,200.

▲ Conn., Newington—HOUSES—Brentwood Homes, Inc., 25 Glenview St., housing Kirkham St. and Hawley St. exten. Owner builds. $3,000,000.

▲ Ind., Indianapolis—HOUSES—Grinslade Constr. Co., 219 E. Ohio St., 225 houses in east side of city, near new industrial plants. Owner builds. $2,000,000.

Ind., Indianapolis—HOMES—Harold Honderich, 6901 Park Ave., 20 homes north side of city on 23-acre tract, own forces, $800,000.

▲ Kan., Kansas City — APARTMENT — Hillcrest Village, Inc., Huron Bldg., apartment, 33 and Minnesota Ave., to V & M Contg. Co., 4030 Chateau Ave., St. Louis 1, Mo., $1,750,000. Barnett-Haynes-Barnett Assoc., Graphic Arts Bldg., Kansas City, Mo., archts.

▲ Mich., Birmingham—HOUSING—Lincoln Constr. Co., 17803 John R. St., 94 brick housing units, Grand Trunk R. R. Station site. Owner builds, $1,000,000.

▲ Mich., Detroit — HOUSING — Miller Homes, Inc., William Weir, genl. mgr., 13535 Livernois St., 350 brick Ridgemont Home units, Eight Mile east Gratiot Ave. and Kelly Rd. sect. Owner builds, $4,080,000.

▲ Mich., Detroit—HOUSING—Practical Home Builders, Inc., 13440 Seven Mile Rd. W., 455 housing units, incl. new streets, Southfield Rd. sect. Owner builds, $3,000,000.

▲ Mo., Kansas City—HOSPITAL—St. Luke's Hospital, 44 St. and Wornall Rd., Zone 2, 5 story hospital north wing, 6 story service bldg., 1 story children's addn., to Swenson Constr. Co., 3305 Terrace St., $1,899,370. Bids 10/4. CD 10/2.

▲ N. Y., Flushing—HOUSES—David Minken, c/o Sohn & Weston, archts., 44 Court St., Brooklyn, Zone 2, 90 one-family houses, Parsons Blvd. and 71 Ave. Owner builds. Approx. $1,000,000.

▲ N. Y., Jackson Heights—APARTMENT—Northridge, c/o N. K. Winston, 22 W. 48 St., New York, Zone 19, 17 six story apartments, on 3 square block areas bounded by Northern Blvd., 32 Ave., 88 and 92 Sts. Owner builds. Approx. $14,000,000. Erwin Gerber, 1180 Raymond Blvd., Newark, N. J., archt.

▲ N. Y., New York—WATER CHILLING PLANT—Empire State, Inc., 350 Fifth Ave., Zone 1, water chilling plant in Empire State Bldg., to Starrett Bros. & Eken, Inc., 63 Wall St., Zone 5, $1,500,000. Edward E. Ashley, 10 E. 40 St., Zone 17, engr. Edwards & Hjorth 1267 Avenue of the Americas, Zone 19, structural engrs. CD 10/20.

▲N. Y., Queens Village—APARTMENT—Gross-Morton, 255-55 Union Turnpike, Glen Oaks, 2 story garden apartment for 900 families on 46 acre tract at Springfield Blvd. and 73 Ave. Owner builds. $9,000,000. A. H. Salkowitz, 37-60 82 St., Jackson Heights, archt.

▲ Pa., Phila.—RESIDENCES—Abram Singer Sons, 37 S. 59 St., residential development, Verree Rd., separate contracts. Approx. $2,000,000.

▲ Pa., Phila.—RESIDENCES—M I T North and South Corp., 1405 Bankers Security Bldg., residential development, Island Rd., Madison and Dicks Aves., separate contracts. $2,500,000.

▲ Pa., Quakertown—RESIDENCES—Barrow Builders, 2401 N. 33 St., Phila., residential development, separate contracts. Approx. $2,000,000. Wm. L. Charr, 2311 Delancy St., Phila., archt.

▲ Wis., Milwaukee—RESIDENCE HALL—Association of Marquette University for Women, 1120 W. Clybourn St., Zone 3, 3 story, bsmnt., H-shaped, 36x241 ft. and 44x52 ft., residence hall, to Siesel Constr. Co., 514 E. Ogden St., Zone 2. Approx. $1,000,000. Bids 11/14. CD 10/31.

▲ Que., Quebec City—SCHOOL OF COMMERCE—Prov. Govt. and Laval University, Quebec City, 3 story, one section with 6 story tower unit, 75x325 ft., rein.-con. structural steel, stone, school of commerce, St. Foye, to Komo Constr. Ltd., 1500 St. Vallier St. Approx. $2,000,000. CD 11/3.

INDUSTRIAL BUILDINGS

BIDS ASKED

N. C., Charlotte — PLANT — B.A. 12/29 — Southern Dairies, Inc., c/o Wm. C. Stohldrier, archt., Northcourt Bldg., White Plains, N. Y., ice cream and milk plant. Approx. $100,000. Plans deposit $50. CD 5/28/46.

SOON LETS CONTRACT

▲ Pa., Morrisville—STEEL MILL SITE PREPARATION—Carnegie-Illinois Steel Corp., 434 5 Ave., Pittsburgh, soon lets contract, site preparation for steel mill, grading, track work and paving. Total est. $200,000,000. R. J. MacKenzie, superv. constr. and C. H. Williams, ch. engr., c/o owner. CD 11/14.

CONTRACTS AWARDED

▲ Ga., East Point—PLANT—Pittsburgh Plate Glass Co., c/o Robert & Co. Assocs., archts., 96 Poplar St. N.W., Atlanta, paint and varnish mfg. plant, to Ira H. Hardin Co., Zahner Bldg., Atlanta, Approx. $1,000,000. Bids 10/10. CD 10/9.

▲ Ind., Lafayette—FACTORY—Fairfield Mfg. Co., 323 S. Earl St., design and construct steel, concrete, brick face brick stone factory to Austin Co., 510 N. Dearborn St., Chicago, 10, Ill., $2,000,000.

Mich., Lansing—WAREHOUSE—Fisher Body Div. General Motors Corp., General Motors Bldg., Detroit, 115x400 ft., rein.-con. warehouse, Belt Line Railroad site, to Darin & Armstrong, Inc., 2941 Fenkel St., Detroit. $520,400.

▲ O., Columbus—FACTORY—Clark Grave Vault Co., 375 E. 5 St., general contract three 1 story factory bldgs. adding more than 56,000 sq. ft. floor space to plant, to Leo E. Ruisinger, Inc., 851 Frebis St., Approx. $1,000,000.

▲ Pa., Easton—MANUFACTURING—Individual Drinking Cup Co., Inc., 24 and Dixie Ave., 4 story, bsmnt., 150,000 sq. ft. block, brick mfg. bldg. addn. to Lauter Constr. Co., 112 S. 16 St., Phila. $1,000,000. Carson & Carson, 16 S. Broad St., Phila. engrs.

▲ Pa., Phila.—WAREHOUSE—Owner, c/o general contractor, 1 story, mezanine, 300,000 sq. ft., brick, structural steel warehouse, to Barclay White & Co., 22 N. 36 St., $1,500,000. Robert Montgomery Brown, 1728 Spruce St., archt.

▲ S. C., Honea Path—MANUFACTURING—Westover Mills, c/o contractor, mfg. plant, to Daniel Constr. Co., 429 N. Main St., Greenville. Approx. $2,500,000.

▲ Tenn., Memphis—TERMINAL—Shell Oil Co., 549 Suzette St., river front terminal, 3 tanks, capacity more than 3 m. g.; other smaller tanks, approx. 5,000 sq. ft. unheated and heated storage, Riverside and Trigg Sts., tank contract to Chicago Bridge & Iron Co., 332 S. Michigan St., Chicago, Ill.; other constr. to John E. Taylor Constr. Co., 1055 N. Evergreen St. Awarded 12/8.

▲ Tex., Dallas—PARTS DEPOT—Ford Motor Co., 3000 Schaefer St., Dearborn, Mich., design and construct 1 story, 240x500 ft., brick, steel service parts depot, Industrial Blvd. near Continental Ave., to Austin Co., 16112 Euclid Ave., Cleveland, O., approx. $1,200,000.

▲ Ont., Toronto—FACTORY, etc.—Frigidaire Products Co. of Canada Ltd., Commercial Rd., Leaside, superstructure 1 story, 450x1,000 ft., factory, 2 story 80x450 ft. office wing, etc. Warden St. and Pharmacy Ave., Scarborough Twp., to Redfern Constr. Co., Ltd., 88 Laird Dr., Leaside, Est. $7,000,000. Bids 12/5, awarded 12/6. CD 11/27.

UNCLASSIFIED

BIDS ASKED

† Colorado—VALVE, etc.—B.A. 12/28—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Walt Siding, butterfly valve, conduit sections, accessories, portal sleeve, anchor bolts, butterfly valve base for Carter Lake Pressure Tunnel, Estate Park-Foothills Power Aqueduct, Colorado Big Thompson Proj., Spec. DS-3261. Bids 11/7 rejected. L. N. McClellan, ch. engr. CD 11/17, under LB.

OFFICIAL PROPOSALS

Bids: January 19, 1950 (218)

Sewage Disposal Project Philadelphia, Pa.

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING,
SURVEYS AND ZONING

Sealed Proposals will be received at Room 903 City Hall Annex, until 12 o'clock noon, on Friday, January 19, 1951, and opened at that time in Room 903 City Hall Annex, Philadelphia, Pennsylvania.

SOUTHWEST TREATMENT WORKS

The work consists of furnishing all material and labor for construction complete, including all Mechanical equipment, piping, (electrical equipment and plumbing), for eight (8) Sludge digestion tanks 110-ft. diameter and 37'6" high, galleries, valve houses, Pump houses and appurtenant work for the Southwest Treatment Works.

SCHEDULE "A"—
Excavation, General Construction, Mechanical Equipment and Piping—Contract No. SD 132 SW

SCHEDULE "B"—
Electrical Equipment, Conduits and Wiring—Contract No. SD 133 SW

SCHEDULE "C"—
Plumbing—Contract No. SD 134 SW

Plans, proposal forms, and specifications may be obtained in Room 1101, City Hall Annex, Philadelphia. A purchase price of $10.00 is required for the plans which remain the property of the purchaser. Checks should drawn to the order of the Bureau of Engineering, Surveys and Zoning. No bid will be received unless bidder is qualified by the Director of Public Works. The questionnaire form with all questions fully answered must be filed with the Director of Public Works at least one week prior to the date of opening bids.

Each bid must be accompanied by security in form and amount as set forth in the proposal form.

THOMAS BUCKLEY
Director

OFFICIAL PROPOSALS

Bids: December 29, 1950 (223)

Sewage Interceptors, Force Mains & Sewage Treatment Plant

MUNICIPAL AUTHORITY OF THE CITY OF SUNBURY
NORTHUMBERLAND COUNTY,

Sealed proposals for the construction of Sewage Interceptors, Force Mains and a Primary Sewage Treatment Plant will be received by The Municipal Authority of the City of Sunbury until 9:00 A.M., December 29, 1950 at which time the bids will be publicly opened and immediately read in a meeting of the Authority to be held at the Municipal Building, 223 Market Street, Sunbury, Pennsylvania.

The work will be divided into two sections and separate proposals will be received for each portion of the project, as follows:

SECTION NO. I—SEWAGE INTERCEPTORS AND FORCE MAINS, consisting of 12", 18", 24" and 27" interceptors, manholes and other appurtenances and 8", 10", and 12" force mains. Pipe and fittings for force mains will be furnished by the Authority.

SECTION NO. II—PRIMARY SEWAGE TREATMENT PLANT, including a control building, separate sludge digestion tanks, primary clarifiers, detritor, pumping station, chlorine contact tank, sludge drying beds, plumbing, heating and electrical work.

Specifications, Proposal Forms, Drawings, and other contract documents may be examined at the office of Ivan M. Glace, Consulting Engineer, Harrisburg, Pennsylvania, or at the Office of the Authority in Sunbury. A complete set of bidding documents, for either section, may be obtained at the office of the Engineer, upon depositing $15.00 for Section I and $25.00 for Section II. This full amount will be refunded if a bid is submitted and if the documents are returned in good condition within 10 days after the opening of bids. If the documents are not returned within this period, the deposit will be forfeited. No deposit will be returned to non-bidders.

No bid on any of the construction work will be considered unless it is accompanied by the bidder's certified check drawn upon a solvent bank and made payable to the order of the Municipal Authority of the City of Sunbury, for the following sums:—

Project	Bid Security
Sewage Interceptors, Force Mains	$7,500.00
Sewage Treatment Plant	15,000.00
Plumbing Work	10% of Base Bid
Heating Work	10% of Base Bid
Electrical Work	10% of Base Bid

These sums will serve as bid security and will be forfeited to the Authority as liquidated damages in the event an award is made and the contracts and bonds are not promptly and properly executed as required in the specifications.

No bidder may withdraw his bid within 30 days after the actual date of the opening.

The Municipal Authority of the City of Sunbury reserves the right to reject any or all bids, to waive any technical defects, and to accept any bid that it may deem to be for the best interests of the Authority.

BY ORDER OF THE MUNICIPAL AUTHORITY OF THE CITY OF SUNBURY.

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3259) will be received by Bureau of Reclamation, Trenton, Nebraska, January 4, 1951, and then publicly opened for furnishing riprap rock and crushed rock or gravel blanket material for Trenton Dam. Trenton Dam is situated about 2 miles west of Trenton, Nebraska. Principal items are approximately: 140,000 tons of crushed rock or gravel blanket material; and 300,000 tons of riprap rock. Delivery shall commence approximately February 15, 1951, and be completed approximately October 10, 1952. For particulars, address: Bureau of Reclamation, Trenton, Nebraska; or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner. (232)

(Continued on page 73)

OFFICIAL PROPOSALS

APPEAR HERE EACH THURSDAY. PROPOSAL ADVERTISEMENTS ACCEPTED UP TO 10 A.M. FRIDAY FOR THE ISSUE DATED THE FOLLOWING THURSDAY.

(Continued from page 72)

Bids: January 3, 1951 (224)

WASHINGTON SUBURBAN SANITARY COMMISSION
CONTRACT NO. 896-S

Furnishing and Delivering Pipe for Sewer Force Main

Sealed proposals for furnishing and delivering 8,000 feet of 36-inch and/or 42-inch pipe for a sewer force main, will be received in the office of the Purchasing Agent, Room 3 of the Washington Suburban Sanitary Commission, Hamilton Street Hayattsville, Maryland, until 2:00 P.M., Wednesday, January 3, 1951, at which time and place they will be publicly opened and read.

Specifications may be obtained from W. R. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland and from Whitman, Requardt and Associates, 1304 St. Paul Street, Baltimore, Maryland.

DWIGHT B. GALT
WARREN BROWNING
LELAND G. WORTHINGTON
Commissioners.

Bids: January 25, 1951 (230)

Expansion of Temporary Terminal Building Phase 3

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
CONTRACT NYA-145

Sealed proposals for the construction of Phase 3 of the expansion of the Temporary Terminal Building at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, 111 8th Ave., N. Y. 11, until 2:00 P. M. Thursday, January 25, 1951, and thereafter in the Auditorium of the Authority at the same address until 2.30 P. M., on the same date, at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $25.00 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman.

New York, December 21, 1950.

Bids: December 28, 1950 (231)

New Jersey Turnpike Authority

Sealed proposals will be received by the New Jersey Turnpike Authority for:

CONTRACT NO. 52

* * *

The work to be done under this Contract involves the construction of the concrete deck for the Hackensack River Bridge, and other incidental work, all in connection with the construction of the New Jersey Turnpike, across the Hackensack River near Laurel Hill, Hudson County, New Jersey.

Principal items of work include:

Concrete 9,350 Cu. Yds.
Reinforcement Steel 1,850,000 Lbs.

Proposals will be received at the office of the New Jersey Turnpike Authority, 65 Prospect Street, Trenton 8, New Jersey until 10:30 o'clock, Eastern Standard Time on the morning of December 28, 1950 and thereafter in the Veteran's Room of the War Memorial Building, Memorial Drive at Willow Street, Trenton, New Jersey, until 11:00 A. M., Eastern Standard Time, on the same date, at which latter time and place said proposals will be publicly opened and read.

The receipt and opening of proposals is subject to proper prequalification of the bidder in accordance with the regulations adopted by the New Jersey Turnpike Authority. Bidders must also submit with their Proposal a revised financial statement and a statement of plant and equipment.

Contract documents may be seen, and may be inspected by prospective bidders during office hours, after December 13, 1950, at the office of the New Jersey Turnpike Authority, 65 Prospect Street, Trenton 8, New Jersey and at the office of the Consulting Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York, New York.

Contract documents will be furnished for $5.00 for each set, upon application to the Authority. The Payment will not be refunded and contract documents are not required to be returned.

Proposals must be made upon the Standard proposal forms in the manner designated in the Standard Specifications, for Construction of the New Jersey Turnpike, and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and the number of the contract on the outside, and must be accompanied by a certified check drawn to the order of the New Jersey Turnpike Authority and a proposal bond, each for not less than five (5) per cent of the amount of the proposal, but not less than $500.00 nor more than $200,000.00 and must be delivered at the place designated above on or before the hour named. Copies of the proposal form to be used for submitting proposals, of the form for the proposal bond, of the form to be used for the financial statement and for the plan and equipment statement to be submitted with the proposal and of the special adressed envelope are furnished in detached form with the Contract documents.

The Contract will be awarded or the proposals rejected within fifteen (15) days from the date of opening proposals. The right is reserved to reject any or all proposals.

THE NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast
CHAIRMAN

December 11, 1950

Bids: January 25, 1950 (227)

Low Lift Plant Substructure

NORTHEAST STATION FOR THE DEPARTMENT OF WATER SUPPLY
CITY OF DETROIT, MICHIGAN
CONTRACT NO. NE-1

Sealed proposals for the construction of the Northeast Station Low Lift Plant Substructure will be received by the Board of Water Commissioners of the City of Detroit, Michigan. Proposals shall be addressed to the Board of Water Commissioners, City of Detroit, Room 500 Water Board Building, 735 Randolph Street, Detroit 26, Michigan, and shall be endorsed, "Proposal for Contract No. NE-1". Proposals will be received until 10:00 A.M., Eastern Standard Time, January 25, 1951, at which time they will be opened and read aloud in the Board Room, fifth floor, Water Board Building, 735 Randolph Street, Detroit 26, Michigan.

The work consists of the construction and sinking of a reinforced concrete caisson, circular in plan, having an outside diameter of Ninety Four Feet (94') and wall thickness of Eight Feet (8'). The caisson is to be sunk from Elevation 128.00 but the top of the finished structure is to be constructed to Elevation 130.00. It is presently planned, on the basis of information obtained from sub-surface exploration at the site, to land the caisson at Elevation 17.00. However, the precise elevation at which the caisson will be landed will be determined by the Engineer and is subject to confirmation or change, higher or lower, when additional sub-surface soil information is obtained from the borings to be put down under this Contract. If it is determined from the additional information thus obtained that the caisson is to be landed above or below Elevation 17.00, the lump sum price bid will be adjusted in accordance with the provisions of the Contract.

The Contract Documents, including Notice to Bidders, Form of Proposal and Contract, Plans and Specifications, may be examined during business hours, at the office of the Department of Water Supply, Room 706, Water Board Building, Detroit, Michigan. The Contract Documents may be obtained upon making a deposit of Twenty-Five Dollars ($25.00) per set, which sum will be refunded upon the return of the complete Contract Documents in good condition within thirty days after the bid date or if used in making a bonafide proposal.

Each proposal shall be accompanied by a certified check or a satisfactory bidder's bond in an amount not less than five per cent (5%) of the total lump sum price bid, drawn payable to the City of Detroit, Board of Water Commissioners, as security for the acceptance of the Contract.

No proposal may be withdrawn for at least 60 days after the scheduled closing time for receipt of bids.

The Board of Water Commissioners reserves the right to waive any informality in any bid and to accept any bid or to reject any or all bids, should it deem it to be for the best interests of the City of Detroit so to do.

CITY OF DETROIT
BOARD OF WATER COMMISSIONERS
Edward C. Roney, President
R. K. Williams, Vice President
Oscar Wagner
George A. Shaffer
L. G. Lenhardt, Superintendent,
General Manager and Chief Engineer
E. H. Bauer,
Acting Secretary

Bids: December 27, 1950 (216)

Electric Substations and Cables

CONTRACT 428

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A. M., Eastern Standard Time, on Wednesday, December 27, 1950, for Contract 428, for furnishing, testing and delivering two outdoor unit substations each having a capacity of 150 Kva. at 60 cycles, 3-phase, and about 300 feet of 3-Kv. electric cable, 3-conductor No. 6, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of the City of New York, in the amount of one thousand dollars ($1,000.00), for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, requirements as to surety, etc., can be obtained at the office of the Chief Engineer, Room 1311, at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, RUFUS E. McGAHEN, JAMES J. MORAN, Commissioners, Board of Water Supply; RICHARD H. BURKE, Secretary.

(Continued on page 74)

Contractors Watch This Section —

for new projects. Publish your announcements through the proposal sections of *Engineering News-Record* and get their bids.

U. S. Government
(Continued from page 73)

Sealed bids will be received in the office of the Engineering and Construction Director, The Panama Canal, Balboa Heights, Canal Zone, until 10:00 A.M. Eastern Standard Time, December 29, 1950, for furnishing all plant, tools, equipment, materials, labor and services and for performing all work, for clearing, grading and preparation of site for townsite extension at Margarita, Canal Zone.

Copies of plans and specifications may be obtained from the Engineering and Construction Director, Balboa Heights, Canal Zone. Requests should be accompanied by a $10.00 deposit for each set, the deposit to be in the form of a United States money order or certified check payable to "Treasurer, The Panama Canal, Balboa Heights, Canal Zone." The plans and specifications may be inspected at the following places: The Panama Canal, 411 10th St., N. W., Washington 25, D. C. Office of the Inspector in Charge, The Panama Canal, 804 Customs House, Philadelphia 6, Pa. Office of the District Engineer, U. S. Engineer's Office, 4735 East Marginal Way, Seattle 4, Washington. Office of the District Engineer, U. S. Engineer's Office, 751 S. Figueroa Street, Los Angeles 55, California. Office of the District Engineer, U. S. Engineer's Office, 909 17th Street, Denver 2, Colorado. Office of the Inspector in Charge, The Panama Canal, Room 1020, 24 State Street, New York 4, New York. Office of the Inspector in Charge, The Panama Canal, Room 863, U. S. Customs House, 610 South Canal Street, Chicago 7, Ill. Office of the District Engineer, U. S. Engineer's Office, 180 New Montgomery Street, San Francisco 19, California. Office of the District Engineer, U. S. Engineer's Office, 1709 Jackson Street, Omaha 2, Nebraska. Office of the District Engineer, U. S. Engineer's Office, Foot of Prytania Street, New Orleans, La. (219)

Department of Commerce, Bureau of Public Roads, December 8, 1950. SEALED BIDS will be received at the office of the Division Engineer, Bureau of Public Roads, 1440 Columbia Pike, Arlington, Virginia, until 11:00 a.m., E.S.T., JANUARY 10, 1951, for Project 1G2, Baltimore-Washington Parkway, Anne Arundel County, Maryland. Two Reinforced Concrete Structures and Approaches. Length 0.059 Mile. The approximate quantities of the more important items are as follows: 53,000 cu. yd. Excavation, 2,550 cu. yd. Cement Concrete, 270,000 lb. Reinforcing Steel, 350 cu. yd. Stone Masonry and 4,000 lin. ft. Treated Timber Piling. Minimum wage rates have been fixed as required by law. For plans and specifications, a deposit of $10.00 cash or CERTIFIED check made payable to the Treasurer of the United States, will be required to insure their return within 15 days after the opening of bids. Plans, specications and proposal forms may be obtained at the address given above. H. J. Spelman, Division Engineer. (229)

MISSOURI RIVER BASIN PROJECT Design Section Casper, Wyoming December 4, 1950

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION. NOTICE IS HEREBY GIVEN that sealed bids on Specifications No. 7038-163 will be received at P. O. Box 280, Reclamation Center, Casper, Wyoming, until 10 a.m., Mountain Standard Time, December 28, 1950, and then publicly opened for furnishing and delivering Prefabricated Building for Control House at Sinclair Substation, Transmission Division, Wyoming, Missouri River Basin Project.

Copies on the standard forms and of the specifications may be obtained from the following offices of the Bureau of Reclamation: Avery A. Batson, Regional Director, New Customhouse, Denver, Colorado, and I. J. Matthews, District Manager, P. O. Box 280, Casper, Wyoming. No charge to prospective bidders for copies of the specifications; to others $0.25 per copy, not returnable. (228)

OFFICIAL PROPOSALS

Bids: January 10, 1950 (213)

Intercepter—Sec. A

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF FINANCE
DIVISION OF PURCHASES
NOTICE TO SEWER CONTRACTORS

Sealed bids for constructing TAFT ST.—PLEASANT ST. BRANCH INTERCEPTER, SEC. A., in Pawtucket, Rhode Island, will be received at office of State Purchasing Agent, State House, Providence until 10:00 a.m., Eastern Standard Time on January 10, 1951 and publicly opened and read at that time.

Project involves 680 ft. of inverted siphon, including 500 ft. of subaqueous work in Seekonk River. Inverted siphon consists of one line of 48-in., and one line of 30-in. precast, concrete pipe, and one line of 16-in. cast-iron pipe, all laid in same trench, and appurtenant work.

Drawings and contract documents may be seen at above office or office of Blackstone Valley Sewer District Commission, State Office Building, or Metcalf & Eddy, Engineers, 1300 Statler building, Boston, Massachusetts, weekdays except Saturdays and holidays, 8:30 a.m. to 4:30 p.m., and may be obtained from office of State Purchasing Agent on $35 deposit.

Bid Security $20,000 certified check, bid bond, or cash, performance bond 100 percent.

Prevailing wage rates and public Work labor laws applicable.

FRANKLYN A. ADAMS
State Purchasing Agent

Bids: January 10, 1950 (214)

Intercepter—Sec. B

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF FINANCE
DIVISION OF PURCHASES
NOTICE TO SEWER CONTRACTORS

Sealed bids for constructing TAFT ST.—PLEASANT ST. BRANCH INTERCEPTER, SEC. B, in Pawtucket, Rhode Island, will be received at office of State Purchasing Agent, State House, Providence until 10:00 a.m., Eastern Standard Time on January 10, 1951, and publicly opened and read at that time.

Project involves 615 ft. of 54-in. precast concrete pipe sewer, 4,000 ft. of 42-in. precast concrete pipe sewer including 1,300 ft. in tunnel, and appurtenant work.

Drawings and contract documents may be seen at above office or office of Blackstone Valley Sewer District Commission, State Office Building, or Metcalf & Eddy, Engineers, 1300 Statler Building, Boston, Massachusetts, weekdays except Saturdays and holidays, 8:30 a.m. to 4:30 p.m., and may be obtained from office of State Purchasing Agent on $25 deposit.

Bid Security $25,000 certified check, bid bond, or cash, performance bond 100 percent.

Prevailing wage rates and public Work labor laws applicable.

FRANKLYN A. ADAMS
State Purchasing Agent

Bids: January 4, 1951 (226)

New Roof, Administration Building, Newark Airport, Newark, New Jersey

THE PORT OF NEW YORK AUTHORITY
CONTRACT O & M—110

Sealed proposals for a New Roof on the Administration Building at Newark Airport, Newark, N. J., will be received at the office of the Director of Purchase of The Port of New York Authority, Room 1402, 111 8th Ave., New York 11, until 11:00 A. M., Thursday, January 4, 1951, at which time and place said proposals will be publicly opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase.

THE PORT OF NEW YORK AUTHORITY
HOWARD S. CULLMAN, Chairman
New York, December 21, 1950.

CONTRACTORS
Watch this Section
for New Projects

Publish your announcement thru the "Proposals Section" of Engineering News-Record and get their bids.

Engineering News-Record

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REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

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(Classified Advertising)

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$1.50 a Line, minimum 4 lines. To figure advance payment count 5 average words as a line.
INDIVIDUAL EMPLOYMENT WANTED undisplayed advertising rate is one-half of above rate, payable in advance.
Box Numbers in care of our New York, Chicago and San Francisco Offices count as one additional line.
Replies are forwarded each day as received at each of the offices mentioned without additional charge.
Discount of 10% is allowed if full payment is made in advance for 4 consecutive insertions.

DISPLAYED RATE
The advertising rate $14.25 per inch for all advertising appearing on other than a contract basis. Contract rate quoted on request.
An advertising inch is measured ⅞ inch vertically on one col., 3 col.—18 inches to a page. E.N.R.

New advertisements received by December 22nd will appear in the January 4th issue.

CIVIL SERVICE

SITE PLANNER for Maryland State Planning Commission. Requires degree and experience background in Landscape Architecture. Merit System Position offering Liberal Vacation and Sick Leave, Automatic Salary Increases, Retirement Benefits and Security of Employment. Starting Salary $5175. For complete information contact Office of the State Employment Commissioner, 31 Light Street, Baltimore 2, Maryland.

POSITION OPEN—City Superintendent wanted by city of Zeeland. (Pop. 3800). Will have charge of Diesel power generation plant (3600 KW), power, light and water distribution systems, sewers and disposal facilities consisting of activated sludge treatment plant and digester, streets and parks. One with engineering training or experience in these duties preferred. Salary depending on qualifications. Address E. J. DePree, 134 E. Central Ave., Zeeland, Michigan.

THE TENNESSEE Valley Authority has openings in Knoxville, Tennessee, for Civil, Structural, Mechanical, and Electrical Design Engineers, and for Architectural Draftsmen. Work is in connection with construction of large steam-electric and hydro-electric projects. Entrance salaries based on a 40-hour work week are $3900 and $4650 per annum, depending on training and experience, with provisions for automatic within-grade increases. Retirement, annual and sick leave benefits. Interested candidates should write to Tennessee Valley Authority, Division of Personnel, Knoxville, Tennessee.

POSITIONS VACANT

SALES ENGINEER Wanted—Opportunity for man with construction experience to work into position of Sales Engineer. Experience in general construction desired. Advise age, experience, references, and availability in first letter. Address: R. P. Wilkinson, Economy Forms Corporation, Box 128, Highland Park, Station, Des Moines 13, Iowa.

ENGINEERS WANTED for industrial fire prevention field work by national insurance organization with offices in most major cities. These are permanent jobs with a real future, but candidates should appreciate that extensive away from home travel is involved. Age 26-40 preferred. P-8306, Engineering News-Record.

PERMANENT ESTIMATOR position in Central New York State. Experienced man with a background of estimating complete and versatile projects, large and small, including all types of industrial work, not only standard building and structural phases, but particularly special apparatus and piping installations. Estimator should be adept in broad estimating procedures, as well as detailed specification pricing. Salary commensurate with ability and opportunity for advancement. P-8436, Engineering News-Record.

STRUCTURAL STEEL Detail Draftsmen and Checkers. All types of Structures. Vacation and bonus plan, good working conditions. Only top quality men. Send complete written information. Sanborn, Steketee and Associates, 1214 Cherry Street, Toledo 2, Ohio.

MECHANICAL ENGINEER. Must be graduate with five years or more experience. Required to design and make working drawings for complete projects from rough sketches. Position permanent. Heavy Chemical Plant SW Louisiana. In reply state age, education, experience in detail and salary desired. P-8462, Engineering News-Record.

ASSISTANT TO Supt. of Maintenance.—Graduate mechanical Engineer or equiv. experience. Age 35 or over with thorough experience in maintenance of Chemical Plant or similar, consisting conveyors, pumps, compressors, boilers, stills, dryers, towers, kilns, etc. Duties include investigations requiring Engineering studies and reports on assignments, also inspection and checking reports to keep Supt. informed of work in SW Louisiana. In reply state age, education, experience in detail and salary desired. P-8470, Engineering News-Record.

SALES ENGINEERS for established Eastern manufacturer of admixtures and concrete floor hardeners to travel in Indiana, Kentucky, New York and Northern Ohio, promoting specifications with Architects and Engineers and sales to Contractors. Should have thorough knowledge of Ready Mix Field. Salary. Submit photograph and resume of background and experience in first letter. All replies held confidential. P-8518, Engineering News-Record.

ENGINEERS

ELECTRICAL · MECHANICAL · STRUCTURAL

Openings in Ohio offices offering long term employment with good salary for qualified Group Leaders, Designers and Draftsmen experienced in one or more of the following phases of industrial plant design:

Electrical — Power, lighting layouts and electrical controls.

Mechanical — Plant layout, process piping, conveyors, heating and ventilation, boiler houses, process equipment layout, refrigeration, plumbing, tanks and vessels, packaging equipment, special machinery and equipment.

Structural — Structural steel and reinforced concrete.

Please submit complete resume stating experience, education, salary required and availability date.

THE H. K. FERGUSON COMPANY
Engineers and Builders
The Ferguson Building, 1783 East 11th Street — Cleveland 14, Ohio

DESIGNER-DRAFTSMAN
WANTED

by long established Engineering firm for work in North Carolina office specializing in Public Works Projects including Steam-Electric Power Plants, Water Purification Plants, Sewage Treatment Plants and other Public Works Projects:

(a) One (1) Architectural Engineer capable of design, layout and production of working plans and specifications and assuming, in addition, supervision of designing and drafting personnel.
(b) Two (2) Designer-Draftsmen for Steam-Electric Power Plant design and preparation of working plans for general and detailed layout including structures, equipment and piping.
(c) Two (2) as per (b) except for work on Water and Sewage Treatment Plants.
(d) Two (2) Draftsmen capable of rapid preparation of completed working drawings from designs by others. Draftsmanship and lettering must be neat and accurate.

Salary open. Furnish complete experience data, samples of workmanship, recent photograph, references, earliest date could report for work, with reply. Only maturely experienced men wanted.

P-8345, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

Engineers Wanted
Civil—Electrical—Mechanical—Structural

***Apply* KAISER ENGINEERS**
Division of Kaiser Industries, Inc.
1924 Broadway — Oakland, California

DRAFTSMEN
STRUCTURAL STEEL
DETAILERS AND CHECKERS
WITH EXPERIENCE
CHAS. E. HESS
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with following among general contractors and builders in N. Y. City area, to sell lumber for well established yard. Lumber experience not necessary. State lines and territory covered, age & salary.

SW-8413, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

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P-8391, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

Graduate ENGINEERS

GOOD OPPORTUNITIES

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MAINTENANCE ENGINEERS: Five to ten years' in planning maintenance work, establishing manpower and material requirements, scheduling and controlling work. Must be thoroughly familiar with Machine and Hand Tools used in Plant Maintenance Work. Must have supervised persons doing maintenance work. Must be graduate. For consultation work.

HEATING AND VENTILATION ENGINEERS: Eight to ten years' progressively difficult experience in field and office problems in heating, ventilating and air-conditioning design. Also, experience in making economical evaluation of alternate methods. Must be graduate.

PROCESS ENGINEERS: Must have at least eight years' industrial plant design and experience with at least three years in responsible charge of design work. Plant experience desirable. Must have experience in chemical plant design calculations, equipment design and plant arrangement, with knowledge of structural, power, instrumentation design, etc. Must be graduate.

Give experience, education, age, references, personal history, salary received and salary expected. Please be complete and specific.

All inquiries will be considered promptly and kept confidential.

E. I. du Pont de Nemours & Co.
(Inc.)
Engineering Department Personnel
WILMINGTON 98, DELAWARE

SALARIED POSITIONS $3,500—$35,000

We offer the original personal employment service (established 41 years). Procedure of highest ethical standards is individualized to your present requirements. Identity covered; present position protected. Ask for particulars.

R. W. BIXBY, Inc., 272 Dun Bldg., Buffalo 2, N.Y.

POSITIONS VACANT

STRUCTURAL ENGINEERS with broad experience in design of bridges and other heavy structures of steel and reinforced concrete. Must be capable of assuming responsible charge of important elements of major projects. These positions offer excellent opportunities for advancement in the organization of a major Consulting Engineer located in the East. State age, education, experience, salary required and when available. P-8489, Engineering News-Record.

WANTED BY large company—technical graduate, preferably one who has had field construction experience with successful contracting organization in concrete work, pile driving, pier construction and general heavy construction. Give age, education, detailed experience record and references in first letter. This is a good opportunity for right man, and will pay salary commensurate with ability. Apply P-8511, Engineering News-Record.

REQUIRED FOR Southwest two experienced draftsmen for design and detailing wood and steel structures, foundations, reinforced concrete and other allied work. Pleasant working conditions. Pension and insurance benefits. Personal traveling expenses refunded. Apply by letter with full details, age, education, experience, etc., to American Smelting and Refining Company, 1112 Mills Building, El Paso, Texas.

ENGINEERING

We anticipate increasing our engineering organization during the next several months for the design of Oil Refinery, Blast Furnace, Open Hearth, Steel Mill and Power Plants.

These men should be qualified as draftsmen, designers, checkers or higher engineering skills on design of piping, instrumentation, pressure vessels, structural steel, concrete, platework, heavy mechanical equipment and electrical.

If you are interested and have engineering design experience on this class of work, write to us for a personnel form for prompt consideration of your qualifications.

This work is in our Cleveland office, and is on a 5-day, 45-hour week basis, with time and one-half over 40 hrs; also, vacation and holiday pay. Steady employment and a good opportunity with a good organization.

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CITY OF DETROIT
Engineers experienced in the design and construction of water works needed for $38,000,000 project. Starting salary $4,223; $4,965; $5,736; $6,586 per year with annual increases. Submit resume of experience with application request.
Detroit Civil Service Commission
1504 Water Board Building
735 Randolph Street, Detroit 26, Michigan

POSITION VACANT

POSITION VACANT—Asphalt Superintendent for New Jersey Turnpike. Must be familiar with latest equipment and methods. P-8422, Engineering News-Record.

POSITIONS WANTED

MASTER MECHANIC, Equipment Supt., Mechanical Operating Engineer, over twenty-five years' experience with erection, repair and maintenance of heavy industrial, power house, pumping stations and marine equipment. Desires permanent position. PW-8407, Engineering News-Record.

CRUSHING PLANT or Sand and Gravel Plant Supt., also heavy grading, specializing in rock removal, 28 years experience. PW-8422, Engineering News-Record.

CIVIL ENGINEER, licensed, 32 years experience industrial, commercial buildings, housing. Design, estimating, contract negotiations, field supervision, maintenance. Some foreign experience, speaks Spanish. Desires responsible position, preferably in East. Willing travel. PW-8441, Engineering News-Record.

JOB ENGINEER—with present employer since 1941—power plant and heavy industrial work—available upon one month's notice. PW-8475, Engineering News-Record.

AVAILABLE AFTER 1st of year, building construction executive. Thoroughly familiar all phases building industry, i.e., estimating, buying sub-contracts, materials, etc., solicitation of new business and field management. PW-8493, Engineering News-Record.

ARCHITECTURAL DRAFTSMAN; structural designer; wants position with industrial, commercial or construction company. PW-8495, Engineering News-Record.

POSITIONS WANTED

CONSTRUCTION SUPERINTENDENT: Concrete pipe manufacturer, 12 years experience. Machine or cast pipe. PW-8507, Engineering News-Record.

COLLEGE GRADUATE, engineering sciences, draft exempt veteran, 25, desires to learn construction engineering with industrial or heavy construction company. Travel desired, training more important than salary. Experienced supervising people and organizing work program. PW-8502, Engineering News-Record.

PURCHASING AGENT Utilities Engineer likes purchasing work, knows inventory thoroughly from six years experience in operations. Desires to locate as Purchasing Agent or Assistant with Utility, Pipeline Co., or Federal Govt. Past year & half has been in charge all Purchasing for Four Utility Properties. Veteran-Draft Proof. Age 27—State Licensed Technical Engineer. PW-8516, Engineering News-Record.

PART TIME WORK WANTED

FREE-LANCE ESTIMATOR — highly skilled, all types construction, all trades. C.E. graduate. Quantity take-offs and pricing. Will call for plans. N. Y. vicinity. LAurelton 5-2393, PTWW-8302, Engineering News-Record.

STRUCTURAL ENGINEER, registered. 26 years experience, desires part time work designing, detailing, checking, etc. PTWW-8391, Engineering News-Record.

N. Y. STATE Licensed Structural Engineer, Designer and Detailer available for part time work. 25 years experience. PTWW-7812, Engineering News-Record.

FREE-LANCE ESTIMATOR — highly skilled, available all times. CE quantity take off, pricing. All trades, all types construction. Your office or mine. Will call for plans. N. Y. C. vicinity. LAurelton 5-3393, PTWW-8302, Engineering News-Record.

SELLING OPPORTUNITY WANTED

CIVIL ENGINEER seeks change. Age 27, married, veteran. Over 4 years design experience bridges, highways: steel, concrete, drainage, specifications, etc. New York State license. Desires broader horizons in sales, New York City area. SA-8514, Engineering News-Record.

BUSINESS OPPORTUNITY

Large Mechanical Corporation
with quarter million in equipment and tools for Plumbing, Heating, Ventilating, Sheet Metal, and Electrical work; with excellent Estimating, Supervising, and Purchasing Departments; good material connections; wide experience in the field of Power Plants, Water Treatment Plants, Government Housing, Hospitals, and Office Buildings, desires to make connection with reliable large General Building and Engineer Contractor. Object—expansion. Location no object. Reply BO-8447, Engineering News-Record.

PATENT ATTORNEY

Patent Practice
before U. S. Patent Office. Validity and infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommel, Registered Patent Attorneys, Suite 454, 815-15th Street, N. W., Washington 5, D. C.

WANTED
Two 13-18 C.Y. Tractor Drawn Rubber Tired Scrapers
A. S. WIKSTROM, INC.
Skaneateles, N. Y.

WANTED
STEAM CRAWLER CRANE
Approx. ¼ yd.
WHAT HAVE YOU TO OFFER?
W-8520, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

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#95 NORTHWEST DRAGLINE or CRANE

This machine is three years old. Serial No. in the 12000 series. In good clean condition. Equipped with swamp tracks. Murphy Diesel. 80 ft. boom and 1500 watt Kohler Light Plant.

FN-8183, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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Lorain L820 Shovel #15135 very clean $23,000
Bay City Model 450 Crane ¾ yard 1948 very clean $12,000
Insley K-12 Crane
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Manitowoc 3500-3 yard Crane and Shovel
Caterpillar D-8's new and used
TD-18 and TD-9 Dozers and HD-19 Dozer
Parsons Model 310 Ditcher
Cleveland Wheel Types and Buckeye Model C-20 Ditchers

Above all in our yard and ready for delivery

A. C. R. COMPANY
19615 Nottingham Rd. Cleveland, Ohio
Tel. Ke. 1-8000

USED EQUIPMENT FOR SALE

1—¾ Yd. Shovel, Model 3 Northwest Caterpillar. Year Model 1929—Serial #2966. Powered with Wisconsin Gas Engine. Condition: Good — Motor Overhauled 1949. Price: $4,000.00.

2—Shovel Fronts for ¾ Yd. Bucyrus-Erie Type B Steam Shovels. Booms, Sticks & Dippers. Condition: Excellent. Price: $500.00 each.

1—Speed Reducer, Model 9DA Falk. 100 H.P. Complete with Couplings. Ratio 11.5 to 1. Shaft Dia.—Input 2", Output 5". Condition: Excellent. Price: $1,000.00.

1—Electric Converter, Model FCE8 Reliance. 1½ H.P., 8 KVA, 440 V., 60 Cy., 3 Phase Continuous °40C RPM 900. Condition: good. Price: $350.00.

1—Air Compressor, 220 ft. Ingersoll-Rand Single Stage. Mounted on International Truck Chassis. Condition: Compressor & Truck—Complete Unit—Good. Price: $1,000.00.

1—Roll Crusher, Martin 18" Style F. Condition: Good. Price: $400.00.

1—Sectional Belt Conveyor—Farquhar #346. 14" x 17' with Motor 1 HP - AC - 3 Phase - 60 Cy. - 440V. Hopper & Discharge Chute. Condition: Good. Price: $200.00.

2—Well Drills, Loomis Model 44 Clipper Full Crawler Blast Hole. Gasoline Powered. Condition: Excellent. Price: $4,500.00 each.

1—Well Drill, Loomis Model 44 Clipper Half Track Blast Hole. Diesel Powered. Condition: Good. Price: $1,000.00.

1—Well Drill, Loomis Model 1½ Clipper Blast Hole, Non-Traction. Diesel Powered. Condition: Good. Price: $1,000.00.

1—Well Drill, Loomis Model 44 Clipper Blast Hole, Non-Traction. Diesel Powered. Condition: Good. Price: $1,000.00.

1—Scale, Exact Weight Style #2225, 10 lb. Tare Beam, Dial 25 lb. Under 5 lb. Over with Duttite Bagholder. Condition: Good. Price $200.

1—Chrysler Motor—Type C36-520 8 Cyl—3 1/4x 4 7/8 Gasoline With Electric Starter. Including $150 Worth of Spare Parts. Condition: Good. Price $500.

Thomasville Stone and Lime Co.
THOMASVILLE, PA.

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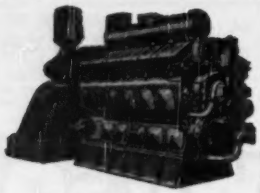

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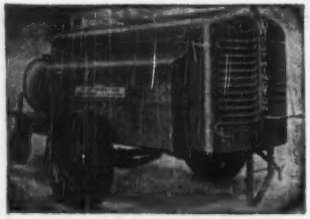

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Pennsylvania 12" x 10" class 3A single cylinder, 355 cubic foot P.D., flat belt driven 50 HP slip ring motor.

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3'x8' Seco double deck screen.

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1½ KW to 135 KW, alternating and direct current, gasoline and diesel powered.

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50' crane-clam boom, 1¼ or 1½-yd.

Lorain 75 fairlead.

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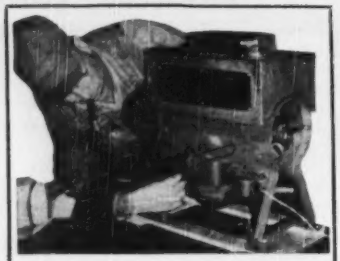

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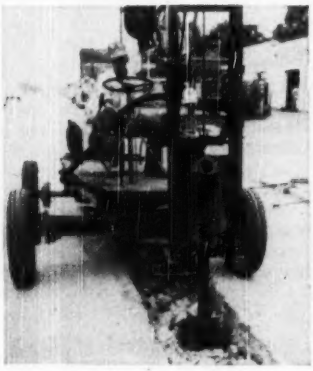

Light-duty pile hammer

Self-propelled hydra hammer is described as a miniature pile driver. The 400-lb hammer is lifted hydraulically, and is free falling to prevent shock to operator or machine. It travels under its own power at speeds to 12 mph. Tower folds for traveling. The sliding tower works a 4-ft-wide trench or hole from side to side without maneuvering the wheels. Adaptable tools allow the hydra hammer to perform several types of work.—Ottawa Steel Products, Inc., Industrial Div., Ottawa, Kans.

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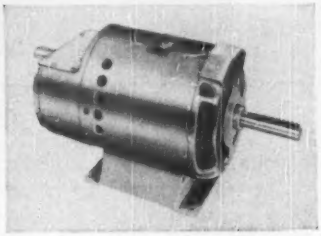

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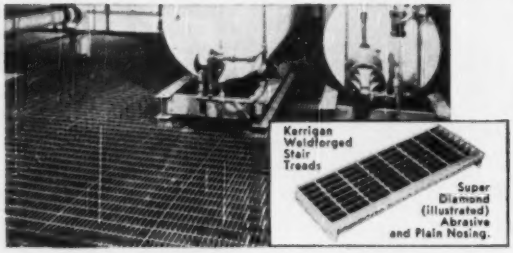

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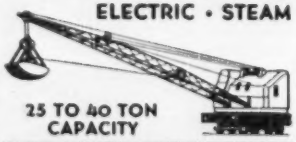

25 TO 40 TON CAPACITY

THE OHIO LOCOMOTIVE CRANE CO
BUCYRUS, OHIO

EPPINGER AND RUSSELL CO.
Wood Preservers Since 1878
80 Eighth Ave., New York 11, N. Y.
PRESSURE TREATED
TIES—POLES—PILING—LUMBER
WITH
Creosote or
Chromated Zinc Chloride
TREATING PLANTS
Jacksonville, Fla. Norfolk, Va.
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Stang WELLPOINT SYSTEM

For KNOW-HOW ENGINEERING SUPERVISION EQUIPMENT to keep jobs DRY

The Stang System has proved its efficiency and economy on both large and small jobs all over the United States. Stang engineering and supervision in planning, installation and operation insures a DRY JOB at all times.

JOHN W. STANG CORPORATION
2 Broadway, New York 4, N. Y.
2123 S. 56th St., Omaha, Nebr.
8221 Atlantic Ave., P.O. Box 631, Bell, Cal.

ging reach, behind the tractor, is 10 ft. Swinging arc is 140 deg. Bucket can be raised high enough to permit direct loading into dump trucks. The standard hoe-type shovel cuts a 18-in.-wide trench. Its capacity is 3.5 ft.—SHERMAN PRODUCTS, INC., 3200 W. 14 MILE ROAD, ROYAL OAK, MICH.

Bolt Die

Ridgid OOR-B bolt die consists of a ratchet drive ring and handle with 10 die heads fitted with ¼ to 1-in. button dies. Button dies are easily reversed for threading close to bolt shoulders or heads. No adjustment is said to be needed for standard threads; an easy adjustment for undersize or oversize threads.—THE RIDGE TOOL CO., ELYRIA, OHIO.

Aluminum Gasoline Torch

Functional design and aluminum construction are features of the new Bernz torches. They are said to be lighter, more efficient, easier to handle, and safer. Improved check valve eliminates need for lock-down after pumping. Lock ring on needle valve prevents the valve from being screwed out or forced out by pressure.—Otto Bernz Co., Inc., 280 Lyell Ave., Rochester 6, N. Y.

Air Circuit Breaker

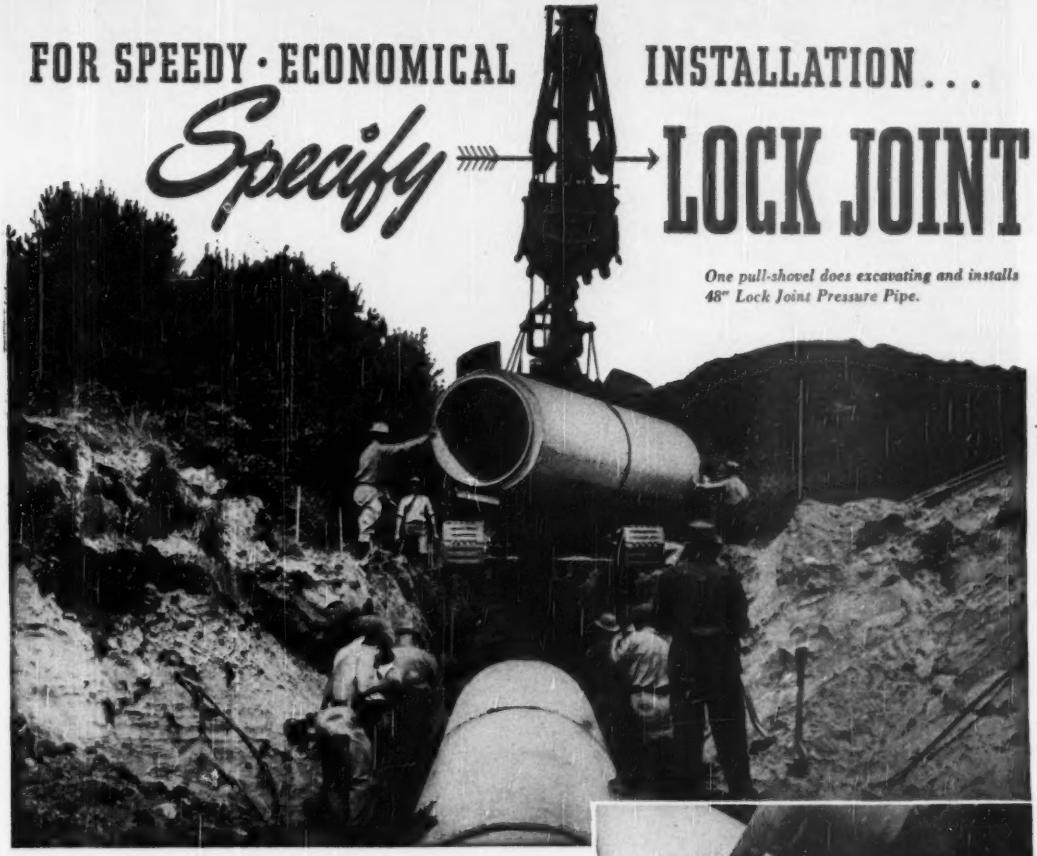
Low-voltage air circuit breakers (Types G-25 and G-50) are available in individual-mounting styles. Particularly effective where frequent operation is expected, the breakers are suitable for protection of lighting loads and small transformers, across-the-line starters, as back-up protection for mo-

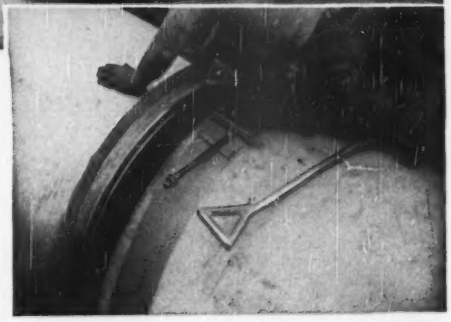
(*Continued on page 89*)

FOR SPEEDY · ECONOMICAL INSTALLATION . . .

Specify LOCK JOINT

One pull-shovel does excavating and installs 48" Lock Joint Pressure Pipe.





Rubber and Steel Joint ready to be pushed home.

With its exclusive Rubber and Steel Joint, Lock Joint Reinforced Concrete Pressure Pipe is installed rapidly and efficiently in extremes of heat or cold—in wet ditch or dry.

Only one machine is required to make the excavation and install the pipe. No caulking or bolting of the joint is necessary, and the pipe may be back-filled immediately. The Rubber and Steel self-centering expansion joint is flexible to accommodate ground settlement, and is watertight at any internal pressures common to American Water Works practice.

Today, millions of feet of Lock Joint Reinforced Concrete Pressure Pipe, equipped with the Rubber and Steel Joint, installed at low cost and needing little or no maintenance, are giving unfailing service throughout the Western hemisphere.

LOCK JOINT PIPE COMPANY

Est. 1905

P.O. Box 969, East Orange, N. J.

PRESSURE PIPE PLANTS: Wharton, N. J., Turner, Kan., Detroit, Mich.

BRANCH OFFICES: Casper, Wyo. • Cheyenne, Wyo. • Denver, Col. Kansas City, Mo. • Valley Park, Mo. • Chicago, Ill. • Rock Island, Ill. Wichita, Kan. • Kenilworth, N. J. • Hartford, Conn. • Tucumcari, N. Mex. Oklahoma City, Okla. • Tulsa, Okla.

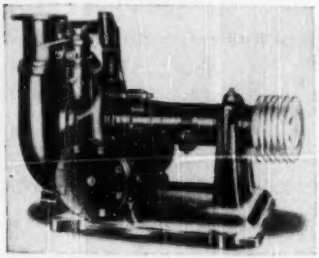
SCOPE OF SERVICES—Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply and Distribution Mains in a wide range of diameters as well as Concrete Pipe of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.

LOCK JOINT
Reinforced Concrete
PRESSURE PIPE

462-Family Apartment Project in Upper New York City—Commanding a sweeping view of the Hudson River, this new apartment project, now nearing completion in the tree-studded Riverdale section of New York City, has facilities for 462 families, in apartment units of from 2 to 4½ rooms. Known as Netherland Gardens, it consists of eleven 6-story brick buildings, each elevator-equipped, plus a 351-car garage. The steelwork is of Bethlehem Structural Shapes. Approximately 75 pct of the project's total plottage is to be landscaped. *Builders:* Albert Exelbert and Alfred Kaskel, New York. *Architects:* Seelig and Finkelstein, Brooklyn. *Steel Fabricator and Erector:* Sherry and Gordon, Inc., New York.

BETHLEHEM STEEL

tor starters, and as main feeder breakers on systems which have ac voltages of 600 and below, fault currents of 25,000 and 50,000 amp, and continuous currents from 35 to 1,600 amp.—Allis-Chalmers Mfg. Co., 1018 S. 70th St., Milwaukee, Wis.



Centrifugal Sand Pump

Model K heavy-duty centrifugal sand pump features two-piece frame construction. This construction permits speedy replacement of the rubber-lined or special-alloy intake chamber. An improved check valve eliminates leakage, provides longer life, better bearing protection, and easier removal of check valve and associated parts. The Model K is available in direct-connected, belt-driven and overhead V-belt-driven types in 1, 1½, 2, 2½, 3, 4, 5, 6, and 8-in. discharge.—A. R. Wilfley & Sons, Inc., Denver, Colo.

All-Plastic Safety Goggle

Interchangeable one-piece lens is a feature of the Saf-I-Duo safety goggle. The lens is made from optilite, and is available in clear or anti-glare green. Goggle frame is made of soft Vinyl.—United States Safety Service Co., 1215 McGee, Kansas City 6, Mo.

Protective Coating

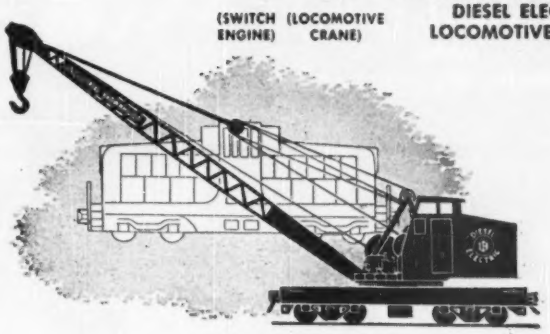
Coating based on Vinylite resins is said to combine the advantages of superior protection, durability, and economy. Applied by spraying, the coating is said to seal out moisture, resist mildew, and withstand unusual

(Continued on next page)

NEW ARITHMETIC FOR COST MINDED EXECUTIVES:

1+1=1 BROWNHOIST

(SWITCH ENGINE) (LOCOMOTIVE CRANE) DIESEL ELECTRIC LOCOMOTIVE-CRANE



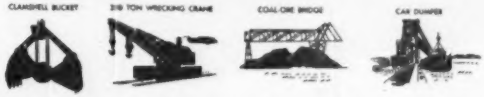
Two big pieces of material handling equipment in one — that's what you get in the Brownhoist Diesel Electric Locomotive-Crane — a heavy-duty switch engine, and a powerful locomotive crane of 30 tons capacity, and up.

New clear-vision boom design allows operator an unobstructed view through the lower end of the boom, an area that is a blind spot on many cranes.

And the Monitor-type cab assures 360° visibility from the operator's position. Safety engineered design gives 14" clearance between revolving upper work and car body.

Write today for more complete information.

BROWNHOIST BUILDS BETTER CRANES



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Core Drilling by Contract

Exploration for coal and other mineral deposits. Foundation test boring and grout hole drilling for bridges, dams and all heavy structures. *Core Drill Contractors for more than 60 years.*

JOY MANUFACTURING CO.
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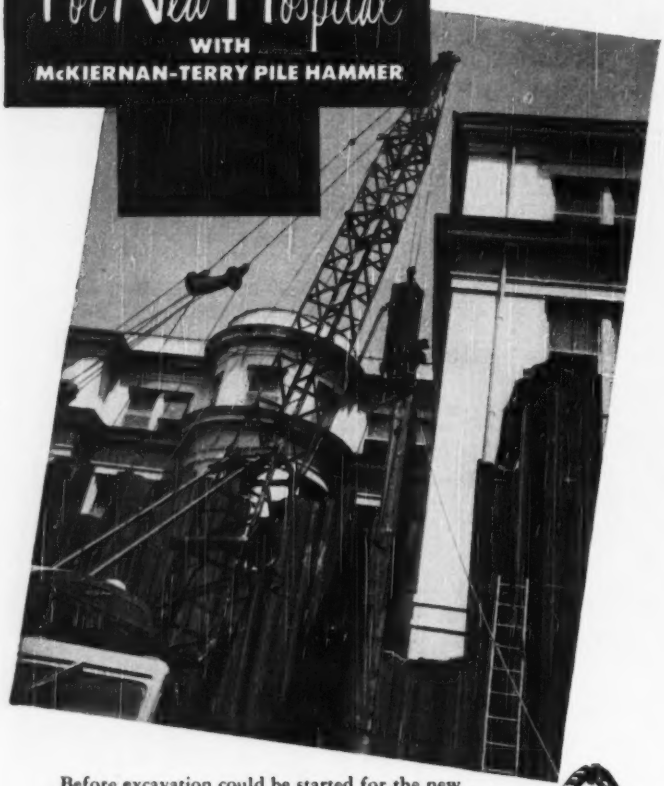
MK-587

FIRST AID
For New Hospital
WITH
McKIERNAN-TERRY PILE HAMMER

A new hospital is being erected in front of the old one in Mobile, Alabama. For quick pile driving, the Ewin Engineering Corp., contractor, used a McKiernan-Terry Pile Hammer.



Before excavation could be started for the new boiler room, a row of steel sheet piling first had to be driven for 130 feet around the sides of the present hospital, and but one foot away from a wing of the existing building. A McKiernan-Terry 9-B-3 was used to do the work speedily and accurately. Later, these piles were pulled out with a McKiernan-Terry E-4 Double-Acting Pile Extractor. 15 sizes of single-acting and double-acting hammers and the 2 sizes of double-acting extractors are available in the complete McKiernan-Terry line. Write for bulletin.

GRAB BUCKETS

COAL TOWERS

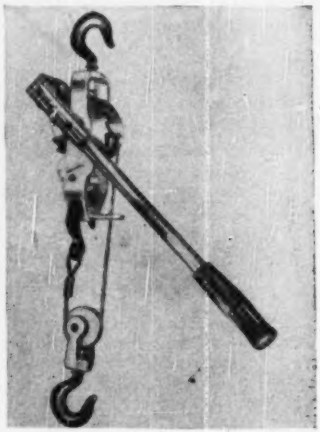
TRANSFER BRIDGES

HONING TO 42" I. D.

McKIERNAN TERRY

McKIERNAN-TERRY CORPORATION, MANUFACTURING ENGINEERS • 13 PARK ROW, NEW YORK 7, N. Y.
PLANTS: HARRISON, N.J. AND DOVER, N. J.

wear. It can be applied on wood, brick, concrete, rock board metals, and other surfaces.—PLASTIC COATING CORP., P. O. BOX 13127, HOUSTON 19, TEX.



Lightweight Winch-Hoist

Lug-All winch-hoist has a 1½-ton capacity. It weighs 8½ lb, and has a 30:1 power ratio. Handle is reversible, and can be removed. A combination of three swivel hooks and a built-in pulley block allows work to be done around corners, and as close as 10 inches at the ¾-ton rating. Locking is positive and automatic. Hoist can be operated in any position. Ten feet of cable winds onto the drum. Extensions of any length are available.—THE LUG-ALL CO., 331 E. LANCASTER AVE., WYNNEWOOD, PA.

New Product Briefs

Speed reducer is designed for in-line reducer applications in the ¼-hp range. The Heliocentric Model 5-E is suitable for installations in which the input rpm does not exceed 1,800. Made by: Universal Gear Corp., Indianapolis, Ind.

Lighting hanger makes a one-man job of hanging fluorescent fixtures. The Guth U-D-T hangers feature an exclusive stem attachment that will not permit turning, twisting, or up and down movement at the ceiling. Made by: The Edwin F. Guth Co., St. Louis 3, Mo.

All-purpose work glove features an all-leather Dura-Thumb. The Dura-Thumb is sewn with one continuous seam on the back, eliminating seams on the front and at the point where thumb meets palm. Made by: Richmond Glove Corp., Richmond, Ind.

REPEAT ORDERS PROVE

"it's right!"

NEW!
Model LD
14,500 lbs.
Gross Vehicle Weight

Immediate Acceptance . . . in many fields . . . greets this true LIGHT-DUTY four-wheel-drive

Announced but a few months ago — the Model LD has already proved itself the complete answer to demand for a *true* light-duty four-wheel-drive. Sparkling performance records have been registered in this entirely new FWD work-range. Most significant, many initial buyers of single units have *repeated* — with orders for additional LD's. Yes, *conventional* trucks and *conversions* have long sought to answer the needs of this broad field. But the LD has demonstrated convincingly that only a *true* four-wheel-drive can supply the correct distribution of load and power—for maximum traction, economy and all-weather safety.

GET ALL THE FACTS on the LD! Ask for this folder, "The Story of the LD". See your FWD distributor or write FWD.

THE FOUR WHEEL DRIVE AUTO CO.
Clintonville, Wisconsin
Canadian Factory: Kitchener, Ont.
World-Wide Sales and Service

Built by the Makers of America's Foremost Heavy-Duty Trucks

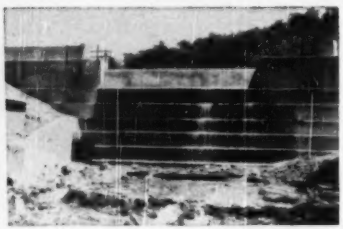
all 3
HEAVY-DUTY
WAYNE CRANE
EXCAVATOR-CRANES
are real
MONEY-MAKERS
—as any Wayne Crane owner will tell you —— or LOOK at the machine . . . and then YOU WILL KNOW!

See Your Wayne Crane Distributor

You are INVITED to visit him for help on any equipment problem. Complete service and parts facilities are maintained by Wayne Crane Distributors in all principal cities.

Mfd. by Wayne Crane Division, American Steel Dredge Co. Inc.
Fort Wayne 1, Indiana

"GUNITE" work by Cement Gun Co. makes Dam Better than New



The picture, above left, shows the advanced state of disintegration that existed when we were called in to repair a 50-year-old Gravity Dam. After we placed a solid "Gunite" blanket on the entire upstream side, seepage through the dam stopped completely. "Gunite" treatment on the down-stream side (above right) makes the dam stronger than when it was originally constructed. Throughout the operation, water was controlled so that the town's supply was not interfered with in any way.

Many instances of repair, remodeling and new construction with "Gunite" are described and pictured in Bulletin A2400. A request on your letterhead will bring your free copy by return mail.

CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
GENERAL OFFICES—ALLENTOWN, PENNA. U.S.A.
MANUFACTURERS OF THE CEMENT GUN

Manufacturers Publications

Wellpoint systems—Interesting, well-prepared catalog contains complete information on equipment used and installation of wellpoint systems. The catalog describes wellpoint systems, tells the procedure to follow in planning a wellpoint installation, illustrates test installations on big jobs, and illustrates and describes the Stang equipment. This includes the Stang wellpoint, wellpoint pumps, jet pumps, and fittings and accessories. The catalog also describes jetting methods and sand-casing methods of installing wellpoints. A large section of the catalog is devoted to descriptions of typical jobs on which the Stang equipment has been successfully used. —JOHN W. STANG CORP., 8221 ATLANTIC AVE., BELL, CALIF.

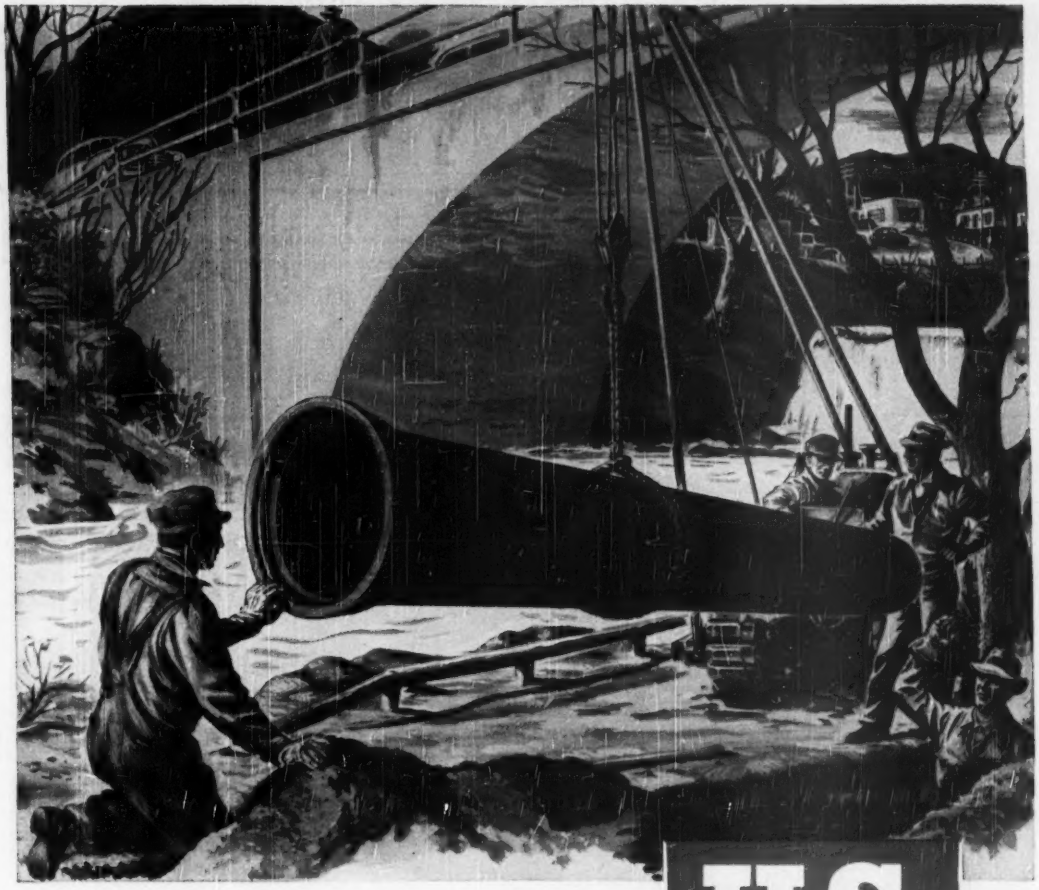
Welding alloys—Folder contains photomicrographs showing how and why Eutectic Low Temperature welding alloys are designed to avoid distortion, stress, warpage, and embrittlement on a wide range of metals. Factual information is presented in question and answer form. The principle of Eutectic welding is explained briefly.—EUTECTIC WELDING ALLOYS CORP., 40 WORTH ST., NEW YORK 13, N. Y.

Surge relief valve—Cushioned surge relief valves are described in this 8-pager. Bulletin W-2 features detailed sectional diagrams of the valve. Parts, materials, and dimensions are tabulated, and valve adjustment, servicing, operation, and other considerations are described and discussed.—GOLDEN-ANDERSON VALVE SPECIALTY CO., 207 KEENAN BLDG., PITTSBURGH 22, PA.

Filtration equipment—Methods and equipment for industrial water filtration are illustrated and compared in detail in Bulletin 691. Pressure-filtration systems are graphically diagrammed to show various applications. Text discusses origins of filtration practice and development of today's filter media and backwashing techniques. Cutaway views, operating data, and piping suggestions for single and battery installations are provided.—R. P. ADAMS CO., INC., 220 E. PARK DRIVE, BUFFALO 17, N. Y.

Pile hammers; breaker balls—Bulletin 950 describes a line of pile hammers and follow blocks, breaker balls, and

(Continued on page 95)



Painted for U. S. Pipe & Foundry Co. by Paul Laune

U.S.
cast iron
PIPE
FOR WATER, GAS, SEWERAGE AND INDUSTRIAL SERVICE

IMAGINE that you have just heard about cast iron pipe for the first time! Would you not be eager to buy some? For what other pipe material used in constructing underground mains is as inexpensive to maintain? What other pipe material has a proved service record of over 100 years in city streets? What other pipe material has all the strength factors of long life that should be required of pipe to be laid in city streets? Our product has lived up to the best traditions of cast iron pressure pipe for 51 years. **United States Pipe and Foundry Co., General Offices: Burlington, New Jersey, Plants and Sales Offices Throughout U. S. A.**

SUMMER OR WINTER, ALWAYS GOOD TRAVELING!

When summer suns beat down, roads built with TARVIA* road tar are glare-free, easy on the eyes, and pleasant to ride on. They blend with any landscape, and do not wave, roll, push, or bleed. Self-healing, they stay smooth without constant care.

When winter's storms of snow and ice come, roads built with TARVIA road tar are more easily kept open for use, for their heat-absorbing black surface melts snow and ice. Moreover, TARVIA road tar is not affected by calcium chloride or sodium chloride.

Barrett's 46 years of experience in road building, maintenance and repair is yours for the asking. *Ask the Barrett field man.*

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Tires find a surer tread for safer driving on the slightly granular, "tractionized" surface of roads built with TARVIA road tar.

Barrett Tarvia* ROAD TAR

*Reg. U. S. Pat. Off.

line weights. Also described are pile-hammer leads. Instructions are included for field replacement of breaker-ball hooks which have sheared or broken, so that the ball need not be scrapped.—EAGLE IRON WORKS, 185 HOLCOMB AVE., DES MOINES, IOWA.

Steel hoist towers—Design and construction of steel hoist towers are listed in a 6-p bulletin. Dimensions, specifications, and diagrams for both light and heavy tubular-steel towers are included in Bulletin HT-2. Sketches and photographs illustrate actual applications.—THE PATENT SCAFFOLDING CO., INC., 38-21 TWELFTH ST., LONG ISLAND CITY 1, N. Y.

Gasoline engines—Catalog PP. W10 features individual listings of seven engine models complete with specifications and detailed drawings. A separate section deals with vertical engines and specialized engineering and mounting.—POWER PRODUCTS CORP., GRAFTON, WIS.

Wire rope for excavators—Unique feature of bulletin on wire rope for excavators is publication of wire rope code under recommendations for specified usages. Line drawings are used to illustrate the various places where rope is used and the sheave arrangements on various types of excavators. Text describes various types of rope strand construction.—JOHN A. ROEBLING'S SONS CO., TRENTON 2, N. J.

Pneumatic-tired roller—Compaction data on 35 and 50-ton pneumatic-tired Roll-O-Pactors is contained in folder RE-89 The bulletin features a description of advantages said to accrue through the use of these rollers. Tables contain data from several jobs listing the types of rollers used, type of material compacted, number of passes, and the density obtained by each roller.—WM. BROS BOILER & MFG. CO., 1057 TENTH AVE., S. E., MINNEAPOLIS 14, MINN.

Wheel-mounted crane—Features and advantages of the Bay City Crane-Mobile are illustrated and described in this 24-p catalog. In addition to stressing important component parts, the bulletin also contains photographs showing this 25-ton-capacity unit in use on all types of construction projects. Individual features described include the pin-connected boom, Hi-Collapsible gantry, independent power boom hoist, precision power-load lowering, removable counterweight, specially designed carrier, and high road speeds.—BAY CITY SHOVELS, INC., BAY CITY, MICH.

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New England's crystal ball . . .

New England has a four-square gospel of progress. The walls of things to come can be neatly tagged: steel, natural gas, power, and clean water.

The most blazing promise for the days ahead is steel.

With war needs and an election for backdrop, with friends in Congress and nods from administration leaders including W. Stuart Symington of the National Security Resources Board, primary production of steel in New England seems more likely than ever.

• **Double study**—Behind the program of the New England Steel Development Corp. is the three-year study of New England Council's steel committee, and the yet unpublicized study of Coverdale and Colpitts, engineers, for which Connecticut paid $60,000.

Both reports are known to favor a project with New London, Conn., the recommended site.

Current thinking of Clifford S. Strike, head of NESD has gone as far as proposing methods of financing the project through federal capital.

• **A money plan**—In a letter, to Senator Brien McMahon of Connecticut, Strike suggested that the government construct the plant, lease it to New England Steel Corp., and then sell it to that company at the end of the war emergency. Failing this Strike suggested a government loan, in conjunction with the sale of $30,000,000 of securities. The project would cost between $250,000,000 to $300,000,000.

Negotiations are in progress with a major coal company for the joint operation of the mill, supplying the firm with 600,000 to 750,000 tons of high volatile coal a year.

Businessmen of New England and New York are both interested in the project, which promises savings on freight alone of $7 to $12 a ton.

• **The jewel-bright flame**—Less speculative, are well-established expectations of natural gas by winter, '51.

Flames in the gas stoves and furnaces of the rugged northeast will burn hotter, and on the coldest days, more will burn than ever.

The Federal Power Commission has decided to divide the New England market between the Northeastern Gas Transmission Co., Boston, a wholly owned subsidiary of Tennessee Gas Transmission Co. and the Algonquin Gas Transmission Co. when the latter can show that it has enough gas.

• **The great divide**—In splitting the territory, FPC gave Northeastern the western section of Massachusetts, all of New Hampshire and part of Connecticut. Algonquin tentatively has Rhode Island, eastern Massachusetts and part of Connecticut.

Algonquin plans to build a line from Texas Eastern's Big Inch line in New Jersey.

• **The water splash**—Another source of energy, water, also is getting full attention in New England. And federal power may become more important.

Earliest gun in the drive went off this week when the Water Resources Policy Commission recommended "cheap" federal hydro for New England through steam plants.

Meanwhile electric cooperatives financed by the Rural Electrification Administration have formed a Northeast Electric Cooperative Association. Its members are combing New England looking for loads to be met by a federally-financed steam plant.

Deadlined for July of 1952 is a special report on the natural resources of New England and New York, undertaken by presidential order by six federal agencies headed by the Army Corps of Engineers (ENR Nov. 16, p. 24). The report is expected to back an objective said to come direct from President Truman: a federal power system extending from Niagara Falls to St. Lawrence and on through New England to Passamaquoddy.

• **A governor's invitation**—Soon after, governors of New England will meet at the invitation of Governor Dever of Massachusetts to consider interstate action in respect to rivers.

Also underway is a limited survey of New England rivers by the Corps of Engineers as approved under the omnibus appropriation bill this year.

And if all these studies are not enough, there are others.

• **And experts, too**—A study of the New England economy under the aegis of the President's Council of Economic Advisers is on the way from a committee of experts on New England.

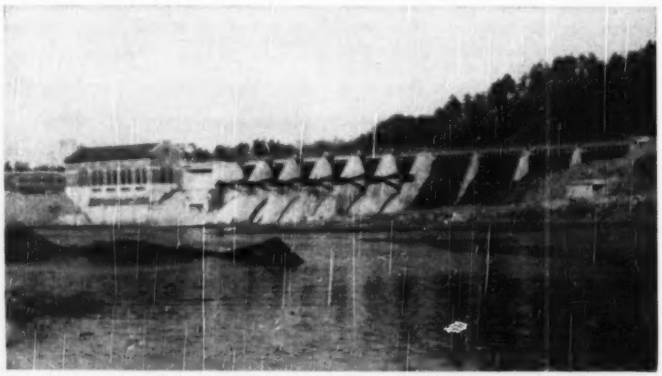
To study the impact of federal government policies on New England is the National Planning Association's Committee for New England, headed by Dr. Leonard Carmichael, president of Tufts College. In charge of its research work is Sumner H. Slichter, Thomas Lamont, Professor of Economics at Harvard University.

• **The water glass**—Although drinking water supplies in New England now are drawn from sources sufficiently far away from polluted waters, the National Water Pollution Control Advisory Board told sanitary and conservation officials of the Northeast that in the future reservoirs might have to be developed at greater distances.

The reason: pollution at nearer supply points.

Stream pollution in southern New England, NWPCAB reports as reaching a serious point. "Little of the principal waters escape. . . damage, and below urban areas of concentrated population and industry, the damages are serious," the board says.

In northern New England heaviest damage has been to water resources used for recreation. Discharge of untreated milk-processing and paper-mill wastes were blamed for pollution in Vermont and New Hampshire along tributaries of the Connecticut River.



NEW ENGLAND DAM—Hydroelectric development of the New England Power Co. across the Connecticut River between Wilder, Vt. and Lebanon, N. H., was put into service on Nov. 29. The installation has two 16,500-kw units and cost $16,000,000.

Dallas Morning News, Dallas, Texas. Archt.—George L. Dahl, Dallas; Consulting Engr.—William Ginsberg, New York City; Structural Engr. — Robert L. Rolfe, Dallas; Contr.—Henry C. Beck Company, Dallas. Pozzolith Ready-Mixed Concrete supplied by Dallas Concrete Company, Dallas.

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- **Prudential Insurance Co., Los Angeles, California.** Archts.—Walter Wurdeman and Welton Becket; Engrs.—Murray Erick Associates; Gen. Contr.—William Simpson Co., all of Los Angeles, Calif.
- **Tunsley Bridge, Hamilton, Ontario.** Minister of Highways—Hon. Geo. H. Doucett; Deputy-Minister of Highways—J. D. Miller; Chief Bridge Engr.—Arthur Sedgewick, Toronto, Ont.; Gen. Contrs.—Therrien Construction Co. Ltd., Toronto, Ontario.
- **Radio Centro, Habana, Cuba.** Architects—Junco, Gaston, y Dominguez. Contractors — Purdy and Henderson. Structural Design — Ing. Jose A. Vila. Supt.: Ing. Bartolo Bestard. Pozzolith Concrete Concretera Nacional, S. A.
- **The Kellog Company Warehouse, Battle Creek, Michigan.** Private Plans—Vern E. Alden, Chicago. Contr.—Herlihy Mid-Continent Co., Chicago

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